

JPRS 81800

20 September 1982

# East Europe Report

ECONOMIC AND INDUSTRIAL AFFAIRS

No. 2317

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FOREIGN BROADCAST INFORMATION SERVICE

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EAST EUROPE REPORT  
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## CONTENTS

## INTERNATIONAL AFFAIRS

Bulgarian-Romanian Trade Relations, Cooperation Reviewed (VUNSHNA TURGOVIYA, No 6, 1982) .....	1
Energy Situation Viewed After Oil Price Explosions (Mihaly Kokeny; NEPSZABADSAG, 4 Aug 82) .....	7

## ALBANIA

Farm Collective Informs Hoxha About Achievements (Tirana Domestic Service, 3 Sep 82) .....	12
Briefs Chrome, Ore Mining Industry .....	13

## BULGARIA

Development, Progress in Bulgarian Shipbuilding Reported (KORABOSTROENE-KORABOPLAVANE, Nos 4-5, 1982) .....	14
Ship Designing in Bulgaria, by Zhecho Bliznakov Achievements of Shipbuilding Institute, by Anastas Karaivanov, Todor Ganchev Organization of Shipbuilding in Bulgaria, by Yordan Karazlatev Development of Scientific Research, by Vasil Apostolov Research and Design in Ship Machine Building, by Aleksandur Ivanov Advertisements	
Biographic Profiles of Managerial, Technical Personnel in Shipbuilding (KORABOSTROENE-KORABOPLAVANE, Nos 4-5, 1982) .....	31

## CZECHOSLOVAKIA

New Program for Improving Construction Industry Outlined (RUDE PRAVO, 9 Jul 82) .....	41
Increased Exports by Use of 'Export Factor' Viewed (Frantisek Novak, Jiri Bidrman; PLANOVANE HOSPODARSTVI, No 5, 1982) .....	52
Briefs	
CSSR-India Trade Session	60
Fires Increasing in CSR	60
Cardiovascular Disorder Statistics	60

## GERMAN DEMOCRATIC REPUBLIC

Preview Provided on Exhibits Planned for Leipzig Fall Fair (AW-DDR-AUSSENWIRTSCHAFT, 4 Aug 82) .....	61
---	----

## HUNGARY

Minister Pushes for Better Use of Agriculture's Production Capacities (Jeno Vancsa; PARTELET, Aug 82) .....	71
United States Portrayed Playing Negative Role in World Trade (FIGYELO, 5 Aug 82) .....	80
Continuing Aid To Weak Co-ops Remains Priority Task (Janos Perczel; NEPSZABADSAG, 2 Sep 82) .....	84

## POLAND

Coal, Energy Developments Outlined (Various sources, various dates) .....	86
Coal Reserves, Explorations, by M. Wodzicki	
Power Industry Development, by Andrzej Kozminski	
Brown Coal Strip Mines	
Brown Coal Production	

## ROMANIA

Decree Sets New Energy Prices, Conservation Measures (ROMANIA LIBERA, 30 Jun 82) .....	94
Development Plans for Electric Power Industry (Various sources, various dates) .....	108
Investment Considerations, by Gheorghe Cocos	
Production Technology, by Gheorghe Saftoiu	
Maintenance Measures, Alexandru Dobrisan Interview	

YUGOSLAVIA

Macedonia Plans Link to Soviet Gas Pipeline (VJESNIK, 24 Aug 82) .....	124
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BULGARIAN-ROMANIAN TRADE RELATIONS, COOPERATION REVIEWED

Sofia VUNSHNA TURGOVIYA in Bulgarian No 6, 1982 pp 6-9

[Text] During recent years, the economic relations between NRB (Bulgarian People's Republic) and SRR (Romanian Socialist Republic) have been developing especially dynamically not only in multilateral cooperation within the framework of SIV (Council for Economic Mutual Assistance), but also on a bilateral basis. The main factor for the constant growing and strengthening of the economic cooperation between them is the continuous growth of scientific, industrial and technical potential of the two fraternal countries, as well as their active participation in the socialist integration. The traditional meetings between comrades T. Zhivkov and N. Ceausescu give a strong impulse to the mutual cooperation. A comprehensive and deep analysis of the achievements is always made at these meetings and new directions of cooperation in mutually agreed areas of the economy, science and engineering are determined. As comrade T. Zhivkov noted during his friendly visit to Bucharest in January this year, "the relations between NRB and SRR, between our two parties and peoples, are friendly and fraternal...indeed they can become an example of relations and cooperation between neighboring socialist countries."\*

The development of Bulgarian-Romanian economic relations is based on strong contractual foundations. Especially important for the future development of the bilateral cooperation is the "Program Agreement for Basic Directions of the Development of Economic, Scientific and Technical Cooperation Between NRB and SRR to 1990" which was signed in June 1980 in Bucharest. Later it was concretized in a number of protocols and agreements for cooperation in specific areas.

As member countries of SIV, Bulgaria and Romania apply contemporary forms of cooperation in their economic relations, such as consultations on basic questions of economic policy, coordinations of their countries' economic plan, joint planning of scientific and technical research, joint production, etc.

The economic relations between the two countries are characterized by a high acceleration of the development of trade between the two countries. The average yearly speed of trade growth for the 1976-1980 period was 12.8

\*RABOTNICHESKO DELO 15 Jan 1982

percent, this is one of the highest levels of Bulgarian trade with other European countries which are members of SIV. From 82.7 million leva the trade between Bulgaria and Romania has increased to 356.8 in 1980 (cf. table).

Trade between NRB and SRR for the 1970-1980 period in million leva

	<u>1970</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>
Export	49.1	107.6	145.3	176.7	170.8	185.0	196.5
Import	33.6	87.7	78.2	140.8	131.8	140.3	160.3
Total	82.7	195.3	223.5	317.5	302.6	325.3	356.8

Source: Yearly Statistical Book of Bulgaria 1981 pp 373, 374.

This dynamic development was especially facilitated by low transportation expenses and the possibility for quick delivery. The mutual interest in active trade in a number of commodities and services is strengthened by a desire for reciprocal complementing of the production and export structures of the two countries.

During the past five-year plan period (1976-1980) the trade share of our country with other member countries of SIV was 2.93 percent and it was ranked fifth after USSR, GDR, PPR, CSSR. The trade volume doubled every five-year plan period. According to the protocol for trade and payments for 1981-85, this increase will be 2.3 times in comparison to the 1976-80 period. There were progressive changes in the trade structure in the last years. The trade in machines, equipment, and chemical products grows at the fastest rate. So for example, while in 1971-75 the comparative share of machines and equipment in our export to Romania was only 40 percent, during the period 1976-80 it reached 45-50 percent, and during this five-year plan period it is projected to be almost 60 percent. Machine tools and battery driven forklifts occupy a considerable share of our export (to 1980 we have exported to Romania over 10,000 battery-driven and motor-driven forklifts) motors and spare parts, store equipment, machines for the textile industry, electronic elements, bearings, products of the ferrous metallurgy, chemistry, textiles, drugs, consumer goods, etc.

Our import from Romania consists mainly of different types of machine tools, high voltage and low voltage electrical installations, machines and equipment for the oil industry, cables, machines for the textile industry, electronic elements, devices for automation, tractors and other agricultural machines, mobile railroad equipment, reinforcement iron bars for the construction industry, products of the ferrous metallurgy and chemical industry, drugs, and consumer goods.

The main place in the mutual trade during this five-year plan period will be occupied by products of the machine-building, chemical and metallurgical industries, while at the same time special attention will be paid to the cooperation in the production and trade of consumer goods, mainly electrical and electronic appliances which will meet the needs of the population.

The problem of cooperation and specialization in the material area occupy a central place in the economic cooperation between our country and Romania. The accumulated experience and constant desire of the two countries to find new and more effective forms for strengthening of the cooperation in this area allowed the signing of a number of important bilateral documents in the period 1976-80. The following contracts are presently in action: three contracts for specialization and cooperation in the field of machine-building, three in electronics and electrical engineering, four in the chemical industry, and one in metallurgy.

At the basis of our industrial cooperation with Romania, lies primarily the specialization of the two contracts within the framework of SIV. In the machine-building industry, mutual efforts were directed mainly in manufacturing of machines and equipment for the food industry, machine tools. Special attention was given to mastering the production and exchange of machine tools with digital program control, automatic turret lathes, cutters, grinding and drilling machines, etc. Especially important for the two countries is the cooperation in the field of transportation machine building, which is reflected in the signing of the General Agreement for specialization and cooperation for the period 1981-1990. According to it, our country will export battery-driven and motor-driven forklifts to Romania and Romania will specialize in the production and will meet the Bulgarian needs of 16, 25, and 50 ton dumptrucks. The agreement also stipulates considerable deliveries of products of the automotive industry.

The cooperative building of the plant for heavy machine building in Ruse-Gjurgevo, in which by the end of this five-year plan period nearly 10,000 people will be employed, gave a new direction to the strengthening of the production assistance and cooperation in this branch between our two countries. By its design and scale, this plant will be a qualitatively new and higher form of production integration in the machine building of the two countries. Active cooperation is being practiced in the field of research and design of new technologies and products. In this case the cooperation in production has a complex character, and the desire to secure an interrupted cycle of "science-production-realization" is evident. The two subsidiaries will operate on a joint production program, as the plant located near Ruse will manufacture mining equipment, metallurgical equipment and some types of equipment for the petro-chemical complexes, while the plant in Gjurgevo will manufacture equipment for geological exploration of small and medium depth, chemical and oil producing equipment, industrial instruments. It is expected that during the first stage of the exploitation of the plant, the volume of production will reach 45-50 thousand tons a year, which not only will satisfy the needs of the two countries, but part of it will be exported to tertiary markets.

In the field of electronics and electrical engineering, both countries directed their efforts to produce electronic elements, electronic calculating instruments, certain types of devices for automation, low voltage instruments, electrical insulation materials, etc. In view of the importance of this branch for the national economies and for furthering the scientific and technical progress, Bulgaria and Romania's main aim has been, through

concrete measures, to widen the cooperation in production of this kind of goods on the basis of existing production capacities in the two countries and through coordination of scientific research work and modernization of technologies.

The cooperation and integration between Bulgaria and Romania in the material field encompasses the chemical industry too, mainly in the production of drugs, some chemical products, including chemical products of small tonnage as well as the ferrous and nonferrous metallurgy.

The main goal of the production assistance and cooperation between our country and Romania is to achieve a more proportional development of separate branches of the national economies, a higher effectiveness in the material production on the basis of scientific and technical progress, a fuller satisfaction of the needs of industrial goods, and also improve the export capabilities of the two countries. Specialization and cooperation are the factors that make mutual trade most dynamic. It is not accidental that in the long-term agreement between the two countries for the 1981-1985 period it is projected that the share of this type of production will reach 46 percent of the total volume.

The cooperation between Bulgaria and Romania in agriculture is being achieved by taking into consideration the specific climatic and natural conditions as well as the degree of intensification of the production in each country. Presently, the two countries actively cooperate in creating sorts and hybrids for the improvement of the already existing ones. During recent years they focused their efforts on improving and raising the degree of mechanization of the working processes in vegetable growing, vine growing, and fruit growing. The activity of the newly created Bulgarian-Romanian technical commission for improved cooperation in the field of complex mechanization and introduction of modern agrotechnical achievements in agriculture will certainly contribute to the further expanding of cooperation in this area. Here there are a number of other possibilities for a fuller meeting of the needs of both countries.

A long-lasting cooperation has also been established in science and technology, where modern forms of scientific and technical relations have successfully been applied. The trend in this field is to achieve production specialization and cooperation between the two countries through mutual assistance. In 1980, the two countries worked out and approved a program for scientific and technical assistance and cooperation until 1990. A central role there is played by conducting of joint exploration, design and construction work in areas of mutual interest. Priority is given to electronics, metallurgy, mining, industry, geological exploration, chemistry, and petrochemistry, nuclear physics, etc. In order to achieve joint projects. Bulgaria and Romania agreed to create temporary task forces which should coordinate the know-how and experience of different experts from the two countries.\*

\*So for example, the technical design for hydroelectric power station at Nikopol-Turnu Mugurele was developed on a joint research program by specialized designing institutes from the two countries. They worked out all phases of this project independently, not knowing what the other side was doing, each (footnote continued on following page)

Certainly, this is a promising form of bilateral cooperation, which leads to considerable savings in research time and cutting of expenses. It can be expected that these collective task forces will create conditions which will lead to fundamental scientific discoveries which, in turn, will be used by the two countries in the interest of their economic, scientific and technical development. In close relation with the further development of cooperation in science and engineering between the two countries lies the problem of closer coordination of their policy of patents and licenses. A project was developed for the direct cooperation in this area in order to coordinate the purchase of licenses from third countries and avoid duplication in this respect, to strengthen the joint actions, to implement in production mutually recognized and registered patents according to joint scientific and technical results, and also their joint sale to third countries.

Another area of active cooperation of mutual interest for the two countries in recent years is their joint activity in third markets. Bulgaria and Romania took a step forward in this direction by founding in May 1980 Bulgarian-Romanian Joint-Stock Company for Economic Cooperation and Trade Activity "Dunav" with headquarters in Bucharest and a representative branch in Sofia. By its nature, this company is the first of this kind among the socialist countries. The company will perform engineering work and services, including consultations, designing, supply of equipment, construction and installation of industrial, transportation and civil projects, training of personnel, will participate in capital investment in partner countries as well as in third countries; it will also conduct trade with the production resulting from the cooperation of the two countries, including the production from the joint plant for heavy machine building in Ruse-Gjurgevo. Last year the company realized its first transactions in Greece, Irak and Libya.

There are a number of unexploited possibilities for further developing and strengthening of the economic and scientific and technical cooperation and integration between Bulgaria and Romania. The discovery and realization of these possibilities depends mainly on the initiative of its direct participants. The building of the hydro-power complex Nikopol-Turnu Mugurele lies ahead, so does the building of a power line of 750kvt which will connect the power systems of USSR, Romania and our country. The two countries undertake a number of measures to meet the needs and save raw and other materials which are scarce in them; for this purpose a joint subcommission was created in February 1980 in Sofia. The following existing possibilities for joint activities are being studied: creating of production capacities for certain alloys and electro-insulating materials; strengthening of cooperation in production of special steels and metallurgical equipment for a full utilization of the production capacity of the industrial branches of mutual interest.

institute using its own methods of work. The doubling of the research was aimed at finding the most effective options for the project. The designing team, structured in this way, developed a design for the power station consisting of 34 volumes of designs, sketches and technical workouts. At the same time there was an exchange of know-how and ideas between the laboratories of the respective institutions about a number of hydraulic experiments.

The main directions and perspectives in building strong and lasting economic, scientific and technical relations between Bulgaria and Romania during the 1980's will again be determined by their participation in the activity of NIV and especially by the fulfillment of the measures in the long-range program for cooperation and also of the long-term bilateral programs. Special attention will be paid to the development and strengthening of the cooperation in the material production and first of all the process of specialization and cooperation in fields of mutual interest. The cooperation between the two countries in searching for deposits of fuels and most important raw materials, including in the Black Sea shelf, will continue to develop. An activating of mutual cooperation in areas of science and engineering, transportation, and tourism is envisaged. The two countries will continue in the future to direct their efforts to implement new and effective forms of cooperation for a fuller utilization of the socialist economic integration in order to further intensify the production, speed up the structural changes in the economies, raise the quality standards of economic activity, which, in its turn, will serve as a basis for a further raising of the material and cultural level of the working people in the two countries.

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CSG: 2200/132

## ENERGY SITUATION VIEWED AFTER OIL PRICE EXPLOSIONS

Subject: NEPESZABANDAS in Hungary 4 Aug 82 p 10

[Article by Mihaly Keregy: "The Energy Situation After Two Price Explosions"]

[Text] World energy consumption declined to a small extent last year. The production of petroleum, the most important energy source, declined by 10 percent in 7 years. The oil production of countries in OPEC is hardly at one-half of their peak achievement. This is all the more noteworthy since world oil production--for more than a half century--increased even in years of the great capitalist world economic crisis of the 1930's. With the decline in world trade in oil this year, prices dropped by 15 to 25 percent. Even with an important setback in production, the exporting countries did not succeed in maintaining the monopoly's balance price.

Will oil be deposed?

The question rises: Will king oil be deposed, and will its role change? It will certainly change, but we cannot expect it to be rapid. Oil will remain the most important energy source to the end of the century and in fact known reserves will make it possible even to increase present production by one and one-half or two times. It will, however, lose the omnipotence with which it has been invested through the years.

In the quarter of a century following World War II, average world energy consumption increased annually by 3 percent, including a 7 to 8 percent increase for oil, gas and electric energy consumption and scarcely a 1 percent rise in coal consumption. In the past decade these ratios changed basically: coal, gas and electric energy consumption increased annually by about 2 percent and oil consumption after a small rise declined in the past 2 years to the 1973 level. Last year's world energy consumption--following the small decline--came to about 7.3 billion tons in equivalent oil value, and the ratio of individual sources developed as follows: oil 40 percent, coal 32 percent, gas 21 percent, water 4 percent, and nuclear energy 3 percent. This means that the former 60 percent share of oil declined by 30 percent, while the share of the other

energy sources increased. In electric energy production, the ratio of nuclear energy approached 9 percent, and in certain developed industrial countries it even exceeded 20 percent.

Also a structural change occurred in the trade of energy sources: coal and gas traffic which once amounted to one-fifth of total trade increased by 20 to 25 percent, and the ratio of oil trade declined under 80 percent. A number of new, large producer countries (Great Britain and Mexico) entered the picture, and at the same time the OPEC share in its traffic declined from 30 percent to 50 percent. This significantly reduced dependence, particularly of the developed European countries, on Near East oil. All this resulted in changing the earlier price-formation factors.

As a consequence of the oil price explosion, the real value of oil in dollars--discounting the effect of inflation--rose by five times in 1981 as compared to 1972, of gas three times, and of coal two and one-half times. Since then, the real value of oil has declined, while the real value of gas and coal continued to increase. In industrially developed countries the wasteful consumption which developed in the era of cheap energy was replaced by strict conservation. Its results are already evident in a broad scope: they succeeded in achieving significant specific energy savings, which even exceed 10 to 15 percent as projected on the national income of the individual countries, or on net domestic production. The greatest savings have been achieved in oil consumption because they concentrated their conservation measures on the energy source which had the greatest price increase and represented import for most of the developed countries.

In recent years the developed capitalist countries have sought on a large scale for energy conservation, primarily oil savings and, where possible, on increasing their own oil production, and still their dependence on imported energy, primarily, oil, is great. Imports projected on total energy consumption make up 80 percent in Japan, 38 percent in the Common Market countries, and 15 percent in the United States.

In world dimensions the biggest consumer of oil is transportation. (It uses about one-third of production.) This is followed by electric energy production, district heating, and household uses (total about 29 percent). The raw material for the petrochemical industry is also oil, world wide about 8 percent of total oil is used for this purpose. By choosing more economic technologies, considerable material and energy savings have been achieved. In transportation a prime requirement became the reduction of specific fuel consumption. In high performance delivery vehicles and self-propelled agricultural power machines they use diesel fuel, internal combustion motors, which consume 25 percent less fuel. Dieselization is also being rapidly extended in medium and large size passenger cars.

## Energy Consumption

The energy-saving outlook which is extending around the world is evident in passenger car purchases, in the selection of type and size (small and medium size are sought after) as well as in driving methods (choice of speed, and so forth). Electrified railroads and trolley-buses are living their days of glory again, they are reducing the weight of vehicle and air resistance. Waste energy (for example, run-off hot water in factories, hotels, hospitals, etc.) is being used by raising the heat to a higher temperature with the use of heat pumps. In the past year oil consumption has not even increased in the energy wasteful United States, and imports have declined.

The linking of material and energy conservation in modern production processes has resulted in significant successes in many areas. In developed countries, iron metallurgy uses 10 to 14 percent of total energy consumption, significant savings can be achieved, for example, with the use of continuous steel casting and powder metallurgy (10 to 12 percent respectively). The collection and processing of waste results in energy savings in most cases. Thus the energy requirement of steel produced from junk iron is one-third to one-half that of steel produced from ore.

The oil price explosions accelerated research in new energy sources, the so-called alternative sources. Because of the untried nature of the technologies, however, these methods are for the time being more expensive.

Several trends of the present, qualitatively new situation promise to be lasting. Above all, the era of cheap energy sources is over, and the new energy sources that will be introduced in the coming decades cannot change this.

As a consequence of the slower introduction of the new energy sources, the slower growth in requirements, and the more rapid realization of energy rationalization measures and production technologies and structures, the consumption structure of energy sources is changing more slowly than expected. The high capital costs further increase the time requirement for structural change.

The developed countries recognized that with expensive energy sources, energy waste would endanger their competitiveness, while more significant energy (oil) imports would upset the payments balance and endanger supply security. Thus, the implementation of energy rationalization and energy-saving technologies--which frequently requires the installation of new machinery and equipment--became one of the key problems of technical development, and had an effect on other areas also in a complex way.

The total energy balance of the CEMA countries is strained but essentially balanced. (There are certain restrictions on use in Poland and Romania.) The

CMEA countries import only a small volume of oil from outside the community, with the exception of Romania, while Poland exports an important amount of coal and the Soviet Union exports oil, and an expanding volume of gas. Until the most recent times, cheap energy did not stimulate the CMEA countries to conserve in consumption. Thus energy consumption per unit of national income is still higher than in the developed capitalist countries. Nevertheless, as a consequence of the realization of delayed but gradually increasing world market prices, the import prices are increasing significantly although they are still well below the world market price. As a consequence of the rise in prices, energy (primarily oil) conservation has been emphasized. According to the current five-year plan, for example, the Soviet Union wishes to reduce by 1 percent energy consumption per unit of national consumption. It is planning to reshape the consumption structure of energy carriers by reducing the ratio of oil and increasing the ratio of coal, nuclear energy, and particularly gas consumption. In recent years, Hungary and the GDR have increased their production in addition to carrying out energy conservation.

#### To Make Up for the Lag

In the past quarter century our country's energy balance was in equilibrium, and there were no significant energy supply problems. But we were late in taking note of the changes in the international energy situation, and decisions were delayed. Thus the structural transformation in the 1960's in favor of hydrocarbons was postponed. Extensive coal production was followed by extensive oil production. Oil derivatives that could have been processed were burned off because of a lag in cracking facilities; heating oil was preferred to a great extent over the use of natural gas or district heating, which had a negative effect on the rate of return of the latter. We did not establish new coal-burning, coupled thermal-electrical works although we had built this kind in the 1950's. Because of oil-centered views, we delayed the construction of the nuclear energy plant. We experienced a late turn in the field of energy conservation. By now we have achieved certain successes both in eliminating the oil-centered outlook and in energy savings: last year total energy consumption declined together with a 1 percent increase in national income and a 7 percent increase in industry. (A role was played in this by the fact that the production of energy-intensive industrial branches declined.) In 8 years, oil consumption--primarily for heating--declined by 2 million tons.

The consumption structure of energy sources has changed advantageously. In the past 3 years oil consumption has declined from 42 percent to 36 percent, and gas has increased from 23 percent to 26 percent and coal from 29 percent to almost 38 percent. Imports of energy sources have declined, but they still exceed 50 percent of total energy consumption. That is, we still have not been able to close the gap which is partly an inheritance from the past and a consequence of late reactions. Energy consumption per unit of national income is still 60 to 70 percent greater than in the most developed countries.

only, however, as a consequence of our less energy-intensive production structure, our specific energy consumption is lower than in other CEMA countries. But we cannot ignore the fact that in certain energy-intensive sub-branches specific consumption is very high in Hungary, too, partly because of outdated technologies, partly because of small plant dimensions and inadequate raw materials. For example, specific energy consumption is 50 to 60 percent higher for a ton of rolled steel than in the most developed industrial countries, and since operational costs in metallurgy are 30 to 40 percent energy costs, this condition will endanger to a great extent the competitiveness of metallurgy, particularly in the sale of products with a low degree of processing.

#### Energetics Investments

About 15 percent of national economic investments and about 40 percent of industrial investments are devoted at present to energy development and conservation goals, which is a significant ratio even by international standards. The priority of energy investments, however, cannot be a goal in itself. With attention to the limited nature of investment possibilities, it is particularly important that--after examining the different variants--we assure the planned satisfaction of needs on the basis of a realistic measurement of the expected savings and the optimum utilization of international cooperation. Within energy investments, it is desirable to increase the ratio of expenditures that result in the conserving of oil and coke--considering that costs for rationalization make up only about one-half of the investments for establishing new sources.

The economic exploitation of domestic mineral fuel resources is desirable, but it is not too likely that it will be further upward evaluated, considering the structural changes. Railroad electrification is proceeding at a new upward swing in Hungary; this provides more energy-saving operations than diesel trains, and in addition it replaces oil. Unfortunately, the exchange of urban automobiles for Hungarian manufactured trolley-buses--where this is economical, for example, on certain hill runs--is scarcely advancing.

Our energy policy is a part not only of the complex energy-producing, delivery, and transformation system but also of energetics machine manufacture which must adjust appropriately to international work distribution. Further significant energy rationalization is possible only by providing the industrial background: machinery, equipment, instruments, automation. We should exploit our capabilities better--our existing capacities, our experiences over a number of decades--in satisfying domestic and export needs for the production of more energy-saving energetics components, machinery, and equipment serving hot and cold production (cold storage plants, etc.). Today energy conservation is one of the most important problems in our economic development. It promotes increased competitiveness, a reduction of import burdens, and contributes significantly to an improvement in the equilibrium of the terms of trade.

## FARM COLLECTIVE INFORMS HOXHA ABOUT ACHIEVEMENTS

AU032053 Tirana Domestic Service in Albanian 1800 GMT 3 Sep 82

[Summary] Comrade Enver Hoxha, first secretary of the AWP Central Committee, has received the following letter from the working collective of the "8 November" Agricultural Enterprise in Maliq [Korce District]:

"Dear Comrade Enver, We the working people of the '8 November' Agricultural Enterprise in Maliq are mobilized this year like never before to implement the great decisions of the Eighth AWP Congress in the field of the constant intensification and development of agriculture, which will lead to the further consolidation of our socialist economy, the increased well-being of all working people and the strengthening of the defense potential of our socialist homeland."

Following your letter to our collective in February this year, all the working people pledged themselves to even greater efforts. "Now that we have completed the great campaign of harvesting, threshing and delivering wheat, we report to you with great joy, Comrade Enver, on the important success that we have attained: on the entire acreage sown with wheat, totalling 1,300 hectares, we achieved an average yield of 57 quintals per hectare, as against 51 quintals planned. We have thus produced 13,000 quintals more than in the previous year and 8,000 quintals more than planned." Despite the damage caused by the storm on 7 July, we achieved yields of 60 quintals per hectare on the lowland acreage of 1,240 hectares, as against the 52.5 quintals that we pledged to you.

All this was achieved because of the determination of all our working people to place agriculture on as scientific a base as possible in accordance with the party's teaching and yours, Comrade Enver. A more advanced technique was used, cultivation was intensified, a better variety of seeds was used and so forth.

We have also just completed the delivery of barley, the plan for which has also been overfulfilled. We also expect to fulfill the sugarbeet plan, with a total acreage of 1,240 hectares. We also expect good results in forage crops, fruit production, meat and milk production and so forth. "The financial results will also be overfulfilled by at least 2 million leks over and above the plan, mainly through a reduction of production costs." However, we are also conscious of the fact that great reserves are still hidden in our economy and will do our utmost to discover and utilize them in order to achieve even greater results in the future.

## ALBANIA

### BRIEFS

CHROME, ORE MINING INDUSTRY--Tirana, 31 August [ATA]--During the current 5 year plan, 1981-1985, it is envisaged that the extraction of chromium, copper and iron-nickel ores in Albania keep increasing at fast rates which range from 30 per cent to 2 times more than during the period of the previous 5-year plan. To this aim, attention has been attached to the growth of production from the existing mines by extending and modernizing them as well as the opening up and building of new ones. The designing, construction, extension and reconstruction of the mines is made full self-reliantly in Albania now. This current 5-year plan envisages the construction of 50 new mines for the extraction of chromium, copper, coal, iron, nickel, bauxides, olivinites, nickel-silicates etc. The number of new mines is two times larger than those constructed during the period of the 6th 5-year plan, along with the construction and commissioning of some mines, work goes on to design other mines. Hence, during the first 6-month period of the current year, 9 new mines were designed. These important projects of the Albanian extracting industry have as their characteristic feature that they are set up in relatively great depths and have a wide extension. Worth mentioning is also that during the designing, construction and commissioning of the new mines, attention is given to the creation of proper environments for a normal work, the setting up of appropriate medical and social-cultural centres for the miners. [Text] [AU311010 Tirana ATA in English 0730 GMT 31 Aug 82]

CSO: 2020/52

DEVELOPMENT, PROGRESS IN BULGARIAN SHIPBUILDING REPORTED

Ship Designing in Bulgaria

Varna KORABOSTROENE-KORABOPLAVANE in Bulgarian Nos 4-5, 82 pp 3-5

[Article by Zhecho Bliznakov]

[Text] We recently celebrated the official centennial of the completion of Boat No 1, which marked the beginning of Bulgarian shipbuilding. However, it is only under the people's regime that we can speak of modern Bulgarian shipbuilding.

Shipbuilding developed particularly actively after the April plenum. Designing was actively strengthened, resulting in the building of 150-ton bulk freighters of the "Galata" class, 300-ton dry-bulk freighters of the "Kom" class, passenger ships of the "G. Dimitrov" and "Alupka" class, 3000-ton dry-bulk freighters of the "Varna" class and 500-ton ships of the "Sofia" class. All of this took place during the maturing period, when the design potential in Varna and Ruse was expanding both quantitatively and qualitatively.

The 1960's were characterized by a new qualitative leap in designing, consistent with the tempestuous expansion of shipbuilding capacities. The Scientific Research and Design-Engineering Shipbuilding Institute (NIPKIK), which was established in 1962 on the basis of the design bureau of the G. Dimitrov shipyards, expanded rapidly. It undertook the designing of 10,000-ton colliers in 1964 and of 23,500-ton bulk-freight ships in 1966 for the Bulgarian maritime fleet. Until then shipbuilding was concentrated exclusively on meeting the needs of our fleet and exports to the socialist countries. In 1968, however, it made its first appearance on the Western market. During the 1970's designs were completed of a 38,000-ton bulk-freight ship and the 100,000-ton tanker "Khan Asparukh." The large design collective proved that it had matured and was able to handle with professional skill the complex assignments based on the shipbuilding production program. In addition to these, dozens of other designs for maritime and riverine ships, built by the Varna, Ruse and Burgas shipyards, were completed. The high quality of the ships designed by the Institute is confirmed by the fact that they are being purchased by many foreign countries, and even by some with highly developed shipbuilding traditions.

The shipbuilding Institute is currently working on new designs for ships which will be built during the Eighth Five-Year Plan. The first container ship with a 400-container capacity ordered by the USSR has been completed. Designs for new modifications of 25,000- and 38,000-ton vessels for bulk freight have been completed and blueprints are being drafted for 5,000- and 15,000-ton general dry-cargo ships; designs for 6,000- and 29,000-ton product carriers are in various stages of completion. The building of river boats, tankers and dry-freight ships built for the USSR at the Iv. Dimitrov Shipyards in Ruse is being updated. The production of a new powerful 3,150-horsepower tug for the Bulgarian Riverine Shipping Administration will be mastered.

Naturally, this does not account for the entire range of new ships which will be designed and built for domestic and export needs this five-year plan.

The ships' hulls are designed with a view to optimizing cross-sections and minimizing flexible design moments. Modern computer programs are being used to this effect. Design improvements and breakdowns of 25,000- and 38,000-ton ships resulted in respective savings of 250 and 600 tons of metal. Particular attention is being paid to the technological nature of the designs. Possibilities are being sought of creating hull modules and considerable successes have been achieved in the case of some ships. For example, in the case of the 5,000-ton "Kaspiya" type tanker, some modules are repeated as many as eight times in the structure of the hull. Even greater successes have been achieved in the building of riverboats virtually the entire hold of which consists of identical modules. Total interchangeability of the ship's sides has been achieved.

The comfort level in the ships is being steadily improved in accordance with contemporary requirements. The latest high-quality materials are being used and standardization of the furnishings is being promoted most energetically. This is based on the module system which will be applied.

The interconnection between blueprints and production method is most apparent in the already applied industrial type treatment method. The unit method of decompartmentalizing machine sections and the diagramming of pipes became the basic method in designing and construction. This allows the carrying out of a great many machine and pipe assembly operations outside the ship under far more favorable shop conditions, the use of progressive methods and technologies, and the enhancement of the level of labor productivity and production quality and standards.

The impact of the global energy crisis was noted also in designing power systems. Heavy fuel is being extensively used, and most advanced models of main engines with minimal fuel outlays are being applied extensively and shaft generator systems are being applied. Other sources of energy savings are sought, such as the use of low-revolution propellers, turbogenerator groups, etc.

With a view to meeting the high standards of the International Convention on the Protection of the Seas from Pollution, ship designs call for advanced systems for the treatment of dumping sewer water and systems for burning

liquid and solid waste. Control over the degree of pollution of dumped water is automated.

The radio navigation systems include the most advanced equipment consistent with international conventions and customer requirements. Radar systems ensure safe navigation and prevention of collisions. Satellite communications are being used.

Automation has extensively entered Bulgarian ship design--ships are no longer designed without automation classes. All vital ship systems are controlled and directed automatically. This particularly applies to the machine and ship systems. Efforts are now focused on automating and optimizing navigation processes. Microprocessor equipment is being extensively used in automation systems. This considerably upgrades their reliability and helps to reduce the size of the crews.

All this proves that the ships designed at the Shipbuilding Institute meet the highest world standards and the demands of even the most exacting foreign and Bulgarian customers. Currently ships are conventionally classified into "traditional" (conventional) and "intelligent" (intellectual). Unlike the first, the second are of a new type and design, with high consumer qualities and saturated with expensive equipment. In this sense, production intellectualization in ship design means a conversion to the construction of more complex ships. This requires an extensive amount of highly skilled labor on the part of the workers, designers and researchers, for which reason such a transition is not merely a question of wish but of real possibilities which, unless they already exist, must be provided. Intellectualization and the science-intensiveness which parallels it call for the creation of a corresponding scientific potential which applies both to scientific workers, designers, technologists and other personnel engaged in scientific services as well as the respective laboratory-experimental base and computer facilities. For this reason the scientific potential must grow both intensively (primarily) and extensively.

Intensive development includes development of a laboratory-experimental base, the expansion of computer centers and availability of minicomputer equipment, the expansion of standardization, improved labor conditions, use of modern materials and minor mechanization facilities, upgrading skills and improving the organization of the work.

Extensive development means increasing the number of personnel engaged in such activities. For example, the servicing of the plant currently built in Burgas calls for opening a branch of the Shipbuilding Institute in the city. Extensive development is an addition to intensive development and a ratio must be maintained between them in which neither one is suppressed or rejected. Furthermore, the natural trend of the intellectualization of human labor in general increases the share of mental work in the overall labor process. Consequently, the increased scientific potential consistent with intellectualized production does not contradict the logic of things but is consistent with development trends.

A suitable design potential is a necessary prerequisite for meeting the requirements of the international market which is distinguished by its dynamic development. Two factors are of particular importance in the acceleration of design work: the use of computers and standardization.

The computerizing of the Shipbuilding Institute has been developed over the past 20 years. However, practical results were achieved in the last decade, when proper material facilities were established at the computer center at the institute. Great expectations are related to computerization although so far practical results throughout the world have been modest. Actual results have been achieved in the automation of computations. However, they account for a small percentage of total design work. A study conducted by the institute in 1979 established with relative accuracy the volume of design which can be automated currently and what has been accomplished so far. It was determined that some 80 percent of operations which could be automated have been. However, this accounts for no more than 8.4 percent of the overall volume of design. We must also bear in mind that this includes the automated designing of pipe systems. Obviously, a great deal remains to be done in this area, mainly the drafting area, which is a worldwide problem. Currently all computations related to ship theory and strength have been automated. A number of optimizing programs for determining the main dimensions of ships and designing cross sections, which guarantee minimal metal outlays, have been applied. Gradually, the institute is taking over the initial molding-preparatory operations carried out with the help of the Foran system. SAPT--an automated pipe design system--is being applied.

With the help of computers a program has been devised for automating activities in the institute. The acute need for drafting automation requires the necessary material facilities in addition to program support.

Standardization in design is a factor with a broad range of action. It guarantees productivity and quality in design and production. However, this activity is only beginning to be developed.

Some successes have been achieved in modular design of the hull and in preparations for the building of the superstructures. A number of manuals have been written on designing the hull, systems, furnishings, pipelines, and others. However, more remains to be done. The efforts must be concentrated on the creation of standardized units in the machine sections. Of late particular attention has been paid to interdesign standardization. Great successes have been achieved in the standardization of boiler systems, power plants, shaft lines, etc. In the future this standardization will be extended to the main power system, which will be helped by mastering the domestic production of main engines.

In its 20 years of creative history the Shipbuilding Institute has proved that it can cope with the complex and responsible assignment of designing ships of the highest quality.

## Achievements of Shipbuilding Institute

Varna KORABOSTROENE-KORABOPLAVANE in Bulgarian Nos 4-5 82 pp 6-7

[Article by Anastas Karaivanov and Todor Ganchev]

[Text] The Founding

The Scientific Research and Design-Engineering Shipbuilding Institute was founded in 1962 on the basis of BCP Central Committee and Council of Ministers Decree No 22. It numbered 167 people.

Design departments: "General Designing," "Hulls," "Equipment," "Furnishings," "Mechanisms," "Systems," and "Electric."

Scientific research sections: "Long-Term Design and Economic Analyses," "Propulsion Qualities," "Navigation Qualities," "Mechanical Systems and Shaft Lines," "Organization and Economics," "Struggle Against Corrosion and Protective Covering," "Weldings," "Control and Economics."

Functional units: "Standardization Department," "Center for Sectorial Scientific and Technical Information on Shipbuilding" (TsONTIK), and others.

### First Designs

During the first years designs were made for the building of the following types of ships for domestic use and export: 150-ton dry-bulk ships "Galata" class; 1,500-2,000-ton dry-bulk ships of the "Sopot" class; 3,000-ton dry-bulk ships of the "Varna" class; 3,200-3,500-ton tramp boats; 1,200 bunker ships; 5,000-ton river-lake tankers; 94-seat passenger ships; 5,000-ton dry-bulk ships "Sofia" class, and others.

The experience which was acquired in the second half of the 1960's made it possible to undertake the designing of heavier-tonnage ships such as a 10,000-ton ship of the "Virela" class, and a 23,500-ton ship of the "Vikhren" class. Designing was paralleled by intensive research activities on selecting an optimal experimental-research base for ship hydrodynamics; determination of vibration and noise characteristics of machines and mechanisms used in Bulgarian shipbuilding; use of mechanized welding in shipyards; the study of acoustical processes in ships, and others.

Designs for ore carriers with a 10/3-ton capacity, a system for breakdown warning, magnetic starters, valves, fire prevention structures, vents, separators, antennas, and a method for standardization of items were developed; a considerable stock of information was acquired.

### Contemporary Stage

The TsNIRD--Center for Scientific Research, Development and Design--was established in 1971. as a basic scientific organization of the NIPKIK. The computer center of the TsNIRD was strengthened. Its main tasks are to

apply general and specialized computers in the subsector, the development of general systems and mathematical software, the creation of models and applied programs and program systems for the automation of engineering work, program support for automated control systems, and others.

In the 1970's dozens of ship designs were created anew or modified, including 25,000- and 38,000-ton ships for bulk freight, which won gold medals at the Plovdiv fair. The flagship of the Bulgarian shipbuilding industry--the tanker "Khan Asparukh"--was built on the basis of a joint design produced by the institute and the Polish shipbuilding industry.

An assembly line for the manufacture of flat sections, a unit installation of systems and pipes, the installation of a totally preassembled main engine, technological items, deck and hoisting mechanisms, hydraulic systems, air conditioning equipment, ship armature, hull facilities, electronic and electrical items, and others were developed and applied in 1972-1973. Five of them were awarded the grade "K," which is the highest possible state quality rating.

In 1975 the NIPKIK was renamed the Shipbuilding Institute. Intensive activities were undertaken to design a base for ship hydrodynamics. In 1976 these activities were separated from the Shipbuilding Institute and a Ship Hydrodynamics Institute was created.

In 1978 the improved design of a 38,000-ton bulk freight ship was awarded the "K" rating by the Higher Certification Commission.

The following designs were completed in 1981-1982: a modified bulk freight ship with a 25,000-ton deadweight, a container carrier for 400 containers, a 2,100-ton tanker, a river tugboat developing 1,300 hp, a 5,000-ton tanker for the Caspian Sea, a 15,000-ton multipurpose ship, a 6,000-ton produce carrier, a 3,500-ton dry freight ship, a 3,150-hp tug, a 29,000-ton produce carrier, and others.

#### Current Basic Activities

Scientific research and laboratory activities in ship design studies, development and methods; research and development of ship power systems and shaft lines; study of and struggle against noise and vibrations in machine departments and housing and public premises. Forecasting the development of shipbuilding and navigation; study of corrosion phenomena on hulls and the struggle against them.

Design of sea and river boats and other navigational equipment; development of presentation, contract, classification and production documentation for the modification and restructuring of transportation and special ships and other navigational equipment based on the production specialization of shipyards, including the development of designs of projects commissioned by foreign firms.

Study and design of all phases of a broad range of ship items and mechanisms, electric power equipment, and automated and electronic systems based on the production nomenclature of plants producing ship goods and mechanisms not only within the system of the Shipbuilding DSO [State Economic Trust] but also in other Bulgarian plants servicing the shipbuilding industry.

Study and development of problems related to shipbuilding technology and organization, mechanization and automation of production with a view to upgrading its level, and participation in resolving problems of investment policy of the Shipbuilding DSO.

Developing and maintaining the level of standardization and normalization activities, standardization of items and designs, and introduction of module structures.

### Organization of Shipbuilding in Bulgaria

Varna KORABOSTROENE-KORABOPLAVANE in Bulgarian Nos 4-5 82 pp 9-11

[Article by Yordan Karazlatev]

[Text] During the past 20 years Bulgarian shipbuilding considerably developed and improved. The second half of the 20th century may be divided into two periods during which qualitative changes in shipbuilding production technology and organization have taken place. Until the end of the 1960's improvements in this area were mainly extensive--expansion of the production-technical base (new docks, slipways, large-scale hoisting, gas cutting, welding and other equipment). More comprehensive studies were undertaken after 1970 with a view to increasing the contribution which technology and organization could make to economic results in shipbuilding. Systems studies and analyses of technological solutions, the optimizing of planning in shipyards, the use of programmed machines and equipment and the mechanization and automation of production processes were developed extensively. During that period technological and organizational requirements for converting shipbuilding essentially into assembling operations increased steadily.

The production-technical base of Bulgarian shipbuilding changed qualitatively. Along with the reconstruction, modernization and expansion of old capacities, new facilities and improved modern technologies were applied. The Shipbuilding Institute in Varna is providing a major impetus in upgrading the technological and organizational standards of Bulgarian shipbuilding and the technological level of ships designed and produced in Bulgaria. Its comprehensive activities in the areas of technology, organization and economics of shipbuilding developed in several main directions: development of the technological part of shipbuilding, designed by institute specialists; studies and scientific research in applied technology related to hull and assembly-completion operations, welding ship structures, improving control operations, setting up standards for labor and material outlays, computations and price setting of designed ships, brigade organization and intracost effectiveness, application of the new economic mechanism in shipbuilding, planning the development of shipbuilding in terms of technology and advancement of technological

processes, and others; and design of machines and equipment for the mechanization and automation of production processes and modernization and reconstruction of production capacities.

Quality changes were achieved in the structure of hull and assembly work in shipbuilding with the help of the following facilities which were developed and applied in the G. Dimitrov Shipbuilding Combine: an assembly line for the manufacture of flat sections, modernized pipe shop for industrial type processing, unit assembly of systems and pipelines, block assembly of ship hulls in drydock, telescoping foundations for the manufacture of flat sections, installation of preassembled main engines, preliminary saturation of sections and blocks, and others. At the same time, technologies were developed and applied for the prelaunching system in hull structures, a new method for center-drilling ship shaft lines by regulating the bearings load with the help of dynamometers, in the course of which the support bearings are reduced from three to one, a new method for the installation of the deadwood and steering mechanisms without grinding operations, which reduces the amount of labor needed by 10-12 percent, standard technical stipulations in assembling ship mechanisms and systems, and technologies for strengthening ship propeller shafts--new designs and norms governing outlays of electric power in welding with confirmed economic results, a technology for the cutting and welding grapple blades, norms governing the outlay of gases for technological requirements in shipbuilding, and many others. A typical example in this respect was the developed overall "Program for Comprehensive Production Mechanization and Automation for the Eighth Five-Year Plan and Through 1990." Particularly topical in shipbuilding is the problem of reducing the amount of work involving unpleasant and hard physical labor. According to this program, during the five-year plan the level of mechanization at the shipbuilding DSO plants will be increased by more than 10 percent.

An open warehouse for metals and a starting line for the preliminary processing of sheets and shaped metal for the Il. Boyadzhiev Shipyards in Burgas were completed in the area of designing machines and equipment and the modernization and reconstruction of production capacities, resulting in considerable savings. Machines were designed for pipe cutting, lines for cutting shaped metal parts, pipes, and others, to be installed soon. Facilities have been completed for the industrial processing of pipes and installation of units by the Il. Boyadzhiev Shipyards and preliminary studies have been completed for a new pipe shop at the Iv. Dimitrov Shipbuilding and Repair Yards in Ruse. The problem of the mechanized cutting and manufacturing of ship pipelines was resolved. A new design technology was developed for feeding, cutting and assembling sheet metal in connection with the modernizing of Il. Boyadzhiev Shipyards.

In the norming area, standards were drafted on labor intensiveness in shipbuilding, broken down by projects and types of work done in shipbuilding combines and plants; in the use of production capacities--in terms of time and extent of workload; on the duration of the building berth and preconstruction period; and the shift coefficient of production machinery. Studies have been undertaken and standards are being drafted on the most costly

materials used in shipbuilding. It is expected that the use of such standards will considerably upgrade the efficiency of these materials.

The new economic mechanism takes into consideration a number of features related to production costs, as a result of which particular attention is being paid to preliminary computations and estimating the price of ships designed at the Shipbuilding Institute. In connection with the application of the new economic mechanism, activities have been expanded in the elaboration and utilization of documents for the brigade organization of labor and cost accounting, and for updating, analyzing and substantiating the economic efficiency and expediency of concentration, specialization and cooperation, use of productive capital, organizational and production structures, material and technical supplies and production rhythm in shipbuilding, etc. The significance of the further intensified elaboration of such problems objectively grows particularly now, when persistent questions are raised related to improving technology, organization and intensification of production, mechanization and automation, and easing heavy physical and unattractive labor. The Shipbuilding Institute will continue to play a determining role in the solution of such problems.

The study of the status of comprehensive production mechanization and automation earmarked the directions to be followed in their further advancement. The following processes have already reached world standards: preliminary preparations of metal sheets and shapes, cutting with digital control machines, manufacturing of flat structures and sections, assembling in blocks and block installations in drydock, and preliminary saturation and use of the unit method at the G. Dimitrov Shipyards and partially at the Iv. Dimitrov Shipyards. The remaining processes, which account for a substantial share of the total, have reached a level which places our shipbuilding mechanization and automation partially on the highest world level and mostly under the world standard.

Ship assembly and finishing operations account for about 68 percent of the overall labor intensiveness in shipbuilding, which objectively requires the use of new and advanced technologies. The most efficient is the module-unit method--the preliminary assembly of units, blocks and modules as a result of which the amount of installation done under shop conditions rather than aboard ship may reach 40-45 percent. This reduces construction time by 40-45 percent and lowers labor intensiveness by 25 percent. The use of the unit method creates conditions for lowering the labor intensiveness in pipe laying operations by more than 20 percent. The applied methods for assembling hulls--by section and block-section--enable us to use the latest developments in world shipbuilding based on preliminary saturation, as a result of which the overall labor intensiveness may be reduced by about 25 percent.

The most typical new studies and developments of the Shipbuilding Institute as regards the shipbuilding industry will be focused on improving the current technological processes and developing new elements in robotics and use of electronics in carrying out basic production operations for open metal warehouses, zero line of processing of sheet and shaped metal, a line for

cutting metal sheets and shapes, a specialized line for the processing of flat, curved and three-dimensional sections, a mechanized line for pipe manufacturing, welding pipe flanges, telescoping beds, a machine for welding double bottoms, studying the possibilities for the application of modules in shipbuilding, industrial processing, assembly and installation of units under the conditions of the individual shipyards, application of precise control in the manufacturing and assembly of ship elements, creating conditions for series manufacturing in the shipbuilding industry through standardization, etc. The implementation of these major tasks will require a persistent policy of production intellectualization.

The solution of these problems, which guarantee high labor productivity and a sharp increase in the volume of output in shipbuilding, is possible only through the joint efforts of researchers, designers and technologists and the active participation of application plants.

#### Development of Scientific Research

Varna KORABOSTROENE-KORABOPLAVANE in Bulgarian Nos 4-5 82 pp 13-14

[Article by Vasil Apostolov]

[Text] The tasks in the area of scientific and technical servicing of the Bulgarian shipbuilding industry stem from the basic purpose of shipbuilding production: the construction of modern types of ships with high technical and operational indicators to meet the needs of the country and export requirements. They can be classified in the following basic areas:

Upgrading the profitability of shipbuilding through changes in the structure of Bulgarian shipbuilding (construction of container carriers, barge carriers, ro-ro boats, ferryboats, tug compositions, floating technological installations and auxiliary ships for the study and exploitation of the maritime shelf, plastic ships, etc); raising the efficiency of the materials and replacing scarce materials with new less expensive ones; upgrading labor intensiveness through automation and robotics; improving labor norming, organization and management; increasing the share of Bulgarian machine building, thus reducing imports; increasing the share of standardized items; converting from single and small-series machine building production to average and large-series production through changes in production design and technological preparations; reducing the process of application of new items and mechanisms, which would also include the purchasing of licenses and industrial cooperation;

Upgrading the competitiveness of our ships by improving their technical and operational qualities; upgrading the reliability and efficiency of the hulls, the engine systems and ship mechanisms and fittings; reducing fuel outlays; improving ship comforts by reducing noise and vibration and increasing amenities; facilitating the labor of the crews by increasing the level of automation of machines and machine units;

Resolving social problems in shipbuilding related to the shortage of manpower as a result of the still substantial number of hard and unattractive types of manual work;

Developing small-tonnage shipbuilding for consumer, recreation and sports requirements.

The successful solution of these problems is largely predetermined by the efficiency of scientific and technical servicing in the shipbuilding industry. Currently the Shipbuilding Institute is conducting its scientific research in the following main directions: forecasting the development of shipbuilding; developing methods and programs for ship designing; ship strength and vibrations; power systems and vibro-acoustical research; chemical problems in shipbuilding; shipbuilding technology, organization and management; research and development of ship mechanisms and items; and ship machine building technology.

The following problems are being resolved on a comprehensive basis: forecasts for substantiating basic development trends in shipbuilding in Bulgaria and its specialization and cooperation within CEMA; mastering the initial stages of designing by the scientific research sections with a view to the development of promising types of highly efficient ships; scientific and technical research aimed at upgrading technical and operational qualities and reliability of hull structures and ship mechanisms; drastically upgrading (with the computer center at the Shipbuilding DSO) of the level of automation of engineering work on the basis of process improvements such as predesign studies, designing and technological preparations of production with a view to considerably reducing design and technological preparations for production and upgrading the productivity of engineering labor.

During the Seventh Five-Year Plan the specialized scientific sections actively contributed to upgrading the level and efficiency of end results in the work of the Shipbuilding Institute. Virtually all scientific developments have been or are being applied. By the end of the Seventh Five-Year Plan the following were completed in the area of forecast studies: forecasts on the construction of maritime ships and domestic navigation vessels in CEMA-member countries and Yugoslavia through 1990; studies and forecasts on the development of general-purpose dry freight ships, ro-ro type ships, ships for combined haulage (multipurpose ships), container carriers, and others.

Considerable successes were achieved in the development of systems for automated ship designing. Currently the Shipbuilding Institute has six specialized program systems with the help of which it resolves problems related to optimal designing of ships at the initial stage. A large number of programs for general ship computations have been developed, considerably reducing the volume of design work.

Various activities are concentrated on improving ship hull design. Great attention is being paid to the optimal designing of the hull in order to achieve a minimal ship mass; optimizing programs are used to reduce the

metal hull mass by 3-5 percent. A large number of programs for computing the strength and vibrations of the hull were developed and applied. Experimental methods as effective means for testing the applied computations and improving the technological processes in shipbuilding and in connection with the use of new materials are becoming increasingly important in research activities.

Intensive studies are under way on various problems related to noise and vibration, aimed at improving the habitability of the ships. Computer methods and programs and an information system on permanent noise control have been developed in order to improve the methods for the theoretical and experimental noise assessment. Attention is currently focused on improving the systems for extensive utilization of the heat released by the burned gases in the ship's power system. A computer method and program have been developed for the technical and economic assessment of the systems. As a result of extensive studies new items were developed and applied in assembling ship shaft lines and mechanisms, such as a keyless switch sleeve with a hydraulic compression assembly, a jackscrew, a vibroinsulating block, vibroinsulating springs, and others.

The following research is under way in the field of anticorrosion ship protection: testing of newly developed or development of new lacquer and dye materials, with the help of the chemical industry, and application of aluminum protective lining. Extensive studies are being made on the application of new sound-, heat-, and fireproof materials, to improve the quality of glass and plastics, and the use of new glues in shipbuilding.

The Shipbuilding Institute does not have sufficient scientific personnel to cover all activities, for which reason currently work is being done to intensify scientific research activities through the comprehensive use of computers in scientific research, further enhancement of the skills of associates and their specialization, and reducing the number of minor topics by combining problems within comprehensive coordination programs.

Prompt and high-quality information support plays an important role in the intensification of scientific research. Under contemporary conditions this can be achieved only through automation. The necessary prerequisites to this have been created: three factographic systems have been developed, and work is under way on the introduction of a documentary information system.

The Shipbuilding Institute maintains close integration relations with a number of scientific organizations domestically and abroad, above all in the Varna area. This is having a beneficial influence on the successful solution of a number of complex problems and on upgrading the standard of the technical and operational qualities of designed ships, mechanisms and items. Integration relations will be developed further during the Eighth Five-Year Plan. This is an important prerequisite for the fullest possible utilization of the combined scientific and technical potential and direct application of leading experience.

The development prospects in scientific research at the Shipbuilding Institute are inseparably related to the steadily growing scientific requirements of the shipbuilding subsector.

#### Research and Design in Ship Machine Building

Varna KORABOSTROENE-KORABOPLAVANE in Bulgarian Nos 4-5 82 pp 16-18

[Article by Aleksandur Ivanov]

[Text] The Shipbuilding Institute began scientific research and design-engineering activities in the field of ship machine building in 1962, when the first independent unit--the "Deck Mechanisms" Department--was set up. It covered the designing of windlasses, capstans and hoisting mechanisms for the small-tonnage 3,000-5,000-ton ships which were being constructed at that time. Later on, on the basis of technical information exchanged through CEMA and within the framework of section No 4, the designing was extended to virtually all deck mechanisms needed in Bulgarian shipbuilding. The acquired experience led to a drastic expansion in the variety of designs of complementing items, such as items for machine boiler departments (pressure containers, heat exchange apparatus, boilers, air conditioning equipment, filters), ship armatures, hatch covers, furnishings, electrical and hydraulic machinery and grapples. The "Ship Items and Mechanisms" line was developed, the activities of which particularly increased during the Sixth Five-Year Plan and which made it possible for the ships under construction to receive a portion of the variety of complementing items.

The shipbuilding production structure is consistent with the line of extensive cooperation and conversion into increasing assembly production, as a result of which with every passing year the significance of ship machine building becomes increasingly important. That is why, quite objectively the theses of the 12th BCP Congress emphasize the development of secondary shipbuilding products.

By the end of the Seventh Five-Year Plan the production capacities of ship machine building plants had become insufficient. The technical standards of some of the plants were no longer consistent with the new requirements, for which reason they are currently being reconstructed and updated. This is the reason for which the share of Bulgarian complementing goods is only half that of countries with developed shipbuilding. Currently the main task in Bulgarian ship machine building is to make a decisive change in this ratio with the help of the other domestic industrial sectors.

The Shipbuilding Institute plays the main role in the development of ship machine building. Supplying the plants engaged in ship machine building with design documentation and the conduct of basic scientific research in this area are concentrated in "Deck Mechanisms," "Hull Equipment," "Grapples," "Auxiliary Mechanisms," "Ship Armature," "Internal Furnishing," "Electric Power Distribution Systems," "Sources of Electric Energy and Electric Drives," and "Electronic Automation." This list of activities is the result of the experience acquired in the course of many years of development. Each of

the specialized design units is engaged in development activities in its line and in all activities related to the standardization and unification of items and systems.

Extensive work was done during the Seventh Five-Year Plan and substantial successes were achieved in the area of ship machine building, aimed at satisfying the needs of the ships under construction with equipment and resolving the problem of mastering and developing the manufacturing of items for export. The "K" quality rating--the highest awarded by the state--was given to the series of refrigerated ship pipe sleeves and cabin air conditioners, safety jackets, automated capstans with a 125-hp traction and an automated ship power switch system.

Activities related to ship machine building technology were organized in 1978, involving specialization in hot and chemical treatment, machine-assembly processing, mechanization and automation facilities, technology of electric power items and organization and development of ship machine building. The tasks in this area cover technological control of structural documentation, development of work technologies, equipment (complete or partial--jointly with the technological departments of the plants), improvements in the technological standard of individual structures and processes, improving the organization of ship machine building plants, and others.

At the same time, a new approach was developed in determining and enhancing the level of specialization of the plants and shops with a view to converting piece rate and small series production into series manufacturing. Standard blueprints for basic workplaces in ship machine building plants are being developed. The developed structure of activities in ship machine building at the institute make it possible to resolve comprehensively problems related to development activities, and technical preparations and organization which ensure the growth and effective development of machine building production. The main stipulation issued at the 12th party congress is to undertake the use of automation systems in decisive production areas with the utilization of computers. In shipbuilding this means the development of an automated system for operative-dispatch production control. This will require the recording of basic computer programs which will encode the entire technical-economic information of the Shipbuilding DSO. In addition to production management, we can also resolve the problem of total production standardization and specialization. The participation of the institute as the main performer in technical production preparations determines the particularly important significance of specialized activities in technical preparations for production.

Currently particular attention is paid to the intellectualizing of engineering work. Programs are being developed for optimizing designs and enriching scientific research through integration with higher educational institutions and related scientific research institutes. Comprehensive and coordination programs are developed for overall engineering management of the "design-application" process, work is being done to use computers in the solution of various problems, etc.

The development of ship machine building during the Eighth Five-Year Plan is focused on mastering new types of items in order to reduce imports from socialist and capitalist countries. The new ships require considerably more complex technical and efficient complementing items for ships, the designing and manufacturing of which is based mainly on the use of domestic and foreign leading experience by purchasing licenses or through industrial cooperation or joint developments. Based on achievements and current nomenclature, the following will be mastered during the Eighth Five-Year Plan and through 1990: several types of boilers (including some for export such as the KUP 80, KUP 150, KUP 240, KAV 1, 6/7, etc), which have higher technical and economic indicators compared with those produced so far, as well as greater reliability; the production of heat exchange apparatus and, particularly, coolers in which plastic is used instead of scarce non-ferrous metals; fixtures for burning solid and liquid waste and systems for the treatment of fecal-waste water (based on foreign experience); deck cranes, fastening attachments for containers, grapplers, elastic connectors for ship shaft lines, etc; anchors and anchor typing mechanisms with hydraulic telemetric control; new types of hatch covers based on an expanded license, a series of manual hydraulic steering mechanisms with and without a driving pump, for exports to the USSR, and so on.

Similar development trends will be pursued in ship electrical systems. The overall efforts will be focused on updating and renovating output. A conversion will be made from individual to standardized structures. This will create conditions for the extensive application of mechanized processes to replace manual technological operations; standardized sections for main switchboards and control panels, deck electric motors, which have been imported so far, ship electrical installation items, lighting equipment, translation-television complexes, firefighting systems, and others will be mastered. In order to restrict imports from capitalist countries the variety and production of goods in the area of ship electronics will be expanded, including systems using microprocessors, equipment for automated diagnosis, and comprehensive electronic relays.

The implementation of these tasks will call for the development of further facilities in the production of auxiliary ship goods through the modernization, reconstruction and expansion of the machine building capacities in ship machine building plants. In accordance with the requirements of party and state documents, a line of maximal development through intensification will be pursued in upgrading labor productivity. The implementation of initiated comprehensive and separate tasks will be continued in the field of technology and organization of ship machine building and we shall undertake the development of technologies for the production of basic items or complex parts and major technological processes based on ESTD forms. Testing stands and important instrument-technological equipment for mastering the production of new goods will be built; ESTPF will be applied; blueprints will be drawn up for the organization of the production process and labor and management in the reconstructed and modernized shops and plants.

The participation of our national industry in equipping the ships with new machines, mechanisms and items, above all the production of main and

auxiliary engines based on Sulzer license, generators, air compressors, refrigeration equipment, combustion apparatus, and others must be considerably increased during the Eighth Five-Year Plan. Specialists from the Shipbuilding Institute are participating in the implementation of these programs.

In order to implement the tasks related to the development and engineering-design activities, whose purpose is to support shipbuilding with modern documentation on a high technical standard, purposeful work must be done to upgrade the skill of designers and technologists and to increase labor intensification and use of electronics.

The purpose of the planned development of ship machine building after 1980 is the further expansion of its efficiency which will influence the efficiency of Bulgarian shipbuilding and whose effect will be multiplied in terms of the water transportation in the country and the foreign trade balance. Scientific research and design-engineering activities in ship machine building, with its already existing traditions, good achievements and even better prospects, will make a considerable contribution to the implementation of these tasks.

#### Advertisements

Varna KORABOSTROENE-KORABOPLAVANE in Bulgarian Nos 4-5 82

[Page 8]

[Text] Ivan Dimitrov Shipbuilding and Ship Repair Combine, Ruse

Builds:

Modern river tugs and towboats, maritime ships, colliers and river and sea tankers.

Director, telephone No 2-45-26

Telex 023-515

[Page 12]

[Text] Iliya Boyadzhiev Shipyards, Burgas

Builds: Reinforced concrete workshops, dredgers with a 500-cubic-meter capacity, 1,800- and 2,000-ton river sections for general and bulk freight, automobile carrier sections, river ferryboats for passenger cars, trucks and passengers, and floating railroad platforms.

Director, telephone No 4-26-34; exchange 4-59-68

[Page 15]

[Text] Enyu Markovski Ship Machine Building Plant, Shumen

Manufactures:

Boilers--utilization, water heating, and auxiliary; heat exchange apparatus, separators, hydrophores, air-foam apparatus, noise suppressants, and spark suppressants for shipbuilding and ship repair work.

Telephones: Director, 6-27-38. Switchboard, 6-03-81 (82).

Telex 73562

Mayak Ship Machine Building Plant, Novi Pazar

Manufactures:

Ship items and mechanisms, fans, ventilation systems, anchors, bitts, observation glass, compensators, partition connectors, grapples, nonstandard equipment.

Telephones: Switchboard, 31-31; director, 20-01; marketing, 21-31.

Telex 73531

Bank account 5423000018

Nedelcho Kamov Ship Electrical Equipment Plant, Turgovishte

The plant specializes in the production of switching-control equipment for automated and capstans, electrical panels for automated control of boiler systems, compressors, separators, refrigeration and air conditioning systems, magnetic switches, ship control panels with automated switches, magnetic stations for control of loading capstans, control columns for electric power switches, sideboard telephone exchanges, terminal and limit switches, and others.

Telephone Nos: Director, 46-33; deputy director, 52-94. Telex 76555.

[Page 19]

[Text] Stoyan Pavlov Ship Machine Building Plant, Varna

Manufacturers: hatch covers, deck mechanisms, ship armature, portholes, main switchboard panels, central control panels, and navigation panels.

Director, telephone 3-12-82; Switchboard, 3-40-11

Telex 77475

1003

CSO: 2202/127

## BIOGRAPHIC PROFILES OF MANAGERIAL, TECHNICAL PERSONNEL IN SHIPBUILDING

Varna KORABOSTROENE-KORABOPLAVANE in Bulgarian Nos 4-5 82 pp 20-23

[Profiles: "With Creative Thoughts on Bulgarian Shipbuilding"]

[Text] In the headlong rush of time, 20 years may look like a single moment. However, they can also represent a full history, providing that they are filled with real actions which have left durable traces. That is why the 20 years since the founding of the Shipbuilding Institute in Varna are both its history and an important period in the history of the entire Bulgarian shipbuilding industry.

The victorious 9 September is in the past. Shipbuilding sought and found its place in the rapid upsurge of socialist Bulgaria's economy. The initial impulse and support were given by the land of the soviets and, with every passing year, shipbuilding gained new positions. The Soviet blueprints became a school for Bulgarian designers who developed designs for a number of ships. The personnel of the design bureau at the G. Dimitrov Shipbuilding and Ship Repair Yards in Varna increased from 50 to 200 and the bureau was given the status of a design organization.

A new stage in the development of scientific thinking in the area of Bulgarian shipbuilding began in 1962, on the 25th anniversary of the designing of the metal self-propelling Galata ship. The party and the government considered that a firm scientific research base was needed to meet the increased requirements and fast pace of development of shipbuilding and repairs. Decree No 22 of the BCP Central Committee and Council of Ministers, dated 13 February 1962, marked the beginning: the scientific research and design-engineering institute (NIPKIK), today's Shipbuilding Institute, was organized on the basis of the facilities of the plant design bureau.

Like all beginnings, this one was inspiring and difficult. For 20 years the institute has steadily developed and strengthened and has been making a considerable contribution to the fact that Bulgaria today is a country with developed shipbuilding and fleet. Ever new ships, designed and manufactured under the guidance of Bulgarian engineers and shipbuilding specialists, marked the past 20 years. The path to the sea for these ships started with the creative thinking and tremendous efforts of designers, engineers, their assistants and the personnel of the Shipbuilding Institute who, through those ships, have dedicated their labor to the sea. Following are a few among the people working in this field of science.



Engineer Zh. Todorov

Zhivko Todorov is one of the pioneers of shipbuilding design in our country. He worked with engineer Vl. Rozhdestvenski and engineer L. Veselinov. Although he retired some 10 years ago, to this day he has maintained the cheerful spirit of a person who has spent a lifetime working. He graduated from the machine department of the Maritime School in 1930 and studied machine engineering in Czechoslovakia. For a while he worked at Koralovag. In 1951 he was appointed chief project designer at the Varna shipyards. Between January 1967 and the end of 1971, when he retired, he was head of the production-design branch of the institute. He managed the design and construction of fast landing barges and floating pumping stations for the Danube River. He was also in charge of the management and authorship supervision in the construction of the series of 3,200-ton Varna class ships with which Bulgarian shipbuilding took a major step in the construction of self-propelling vessels. He also managed the designing of the series of 3,000-ton ships for Poland. His labor and merits to Bulgarian shipbuilding were appreciated by the people's system: Engineer Zh. Todorov was awarded the People's Order of Labor--Silver and Gold.

Georgi At. Georgiev, who has worked in Bulgarian shipbuilding for the past 27 years, was trained at the Leningrad Shipbuilding Institute. Having acquired good theoretical training, until 1962 engineer Georgiev was a leading shipbuilder and chief project engineer at the G. Dimitrov Shipyards in Varna. Following the organization of the NIPKIK he was assigned the important task of deputy chief and, subsequently, chief engineer. He has headed the institute as its director for 15 years, starting in 1965. During that time, under his leadership the institute has been steadily developing and strengthening and has been successfully resolving important problems. As the head of the Shipbuilding Institute, engineer G. Georgiev has made a substantial contribution to the development and establishment



Engineer G. Georgiev

of design-engineering and development activities in shipbuilding and in organizing new activities related to ship mechanisms and shipbuilding technology.

Engineer Georgi Georgiev personally participated in designing the 150- and 3,000-ton dry-bulk maritime ships. He was the chief designer of the 300-ton dry-bulk maritime ships, and others. He has also contributed to training young shipbuilding specialists during his long teaching period at the Higher People's Naval Academy and the Higher Machine-Electrical Institute where he gave a course on ship hull design. Engineer Georgiev has repeatedly been awarded government awards for his tireless work as a shipbuilding specialist and active social efforts, including the People's Order of Labor, Gold, in 1970 and the Order of the Red Labor Banner in 1976. Currently engineer Georgiev is chief designer at the institute.

The 100,000-ton tanker "Khen Asparukh" is usually described at the flagship of Bulgarian shipbuilding and navigation. It was build by the Varna shipbuilders and was designed by one of the most [several words missing in original], as shipbuilding engineer, engineer Tasho G. Popov. Trained as a shipbuilding engineer, for the past 27 years engineer Tasho Popov has practiced his skill and, as most specialists, his career began at the C. Dimitrov Shipyards. From the plant's design bureau he moved to the NIPKIK, where he is employed as chief designer to the present. Engineer Popov has designed a number of ships. In recent years he has specialized mainly in tankers and produce carriers. He was the head designer for the 5,700- and 6,500-ton tankers build for a Norwegian company, whose high qualities fully met the requirements of the classification organizations and the demanding customer.



Engineer T. Popov

The designing of the 100,000-ton tanker included the latest achievements in world tanker construction and high-level mechanization and automation. For the first time, in the building of this largest project of the Bulgarian shipbuilding industry, the unit method of assembly mechanisms at the machine section, the building of the hull consisting of large sections, the installation of a preassembled main engine, and others were applied. Currently engineer T. Popov heads the designing of two new ships--a 6,000-ton and a 29,900-ton produce carrier. The gold People's Order of Labor and the Red Labor Banner Order which the government engineer T. Popov are in recognition of his knowledge and efforts in shipbuilding and active social work.

Engineer Yordan Karazlatev, who has worked for 26 years as shipbuilding specialist, is deputy director of the Shipbuilding Institute and head of the Technology, Organization and Economics of Shipbuilding Department. He is personally involved in the development of problems related to the technology of ships built in Bulgaria, with increasing labor productivity, labor norming and price-setting, long-term planning and forecasting, mechanization and automation of production processes, and modernization and reconstruction of production capacities. It is thanks to engineer Karazlatev that the latest technologies and achievements in shipbuilding have been applied in our shipyards. He has personally headed the formulation of a program for the mechanization and automation of shipbuilding processes and intellectualization in shipbuilding.

The assignments which were developed and carried out under engineer Karazlatev's guidance during the Seventh Five-Year Plan yielded considerable economic results in terms of millions of leva. Two inventions related to improving shipbuilding production are the result of engineer Yordan Karazlatev's constantly curious creative thinking.



Engineer Y. Karazlatev



Engineer T. Ganchev

The 26 years of work which engineer Todor At. Ganchev has dedicated to shipbuilding have been filled with active, creative efforts. An exceptionally energetic person, to this day this alumnus of the Leningrad Shipbuilding Institute works with the enthusiasm of a young man. The G. Dimitrov Shipyards was the first enterprise in which the young specialist applied his knowledge as senior designer, department chief, chief designer, chief of the design

bureau, director of the scientific research and design-engineering institute at its creation, deputy director in charge of technical affairs at the plant, and first deputy general director of the Shipbuilding DSO. He is currently chief designer at the Shipbuilding Institute. In addition to these direct responsible assignments, for the past 18 years he has found the time and strength to participate in the training of young shipbuilding cadres as teacher at the naval academy and the VMEI [Higher Machine-Electrical Institute] in Varna, where he teaches ship design theory, and is the adviser of a large number of postgraduate students.

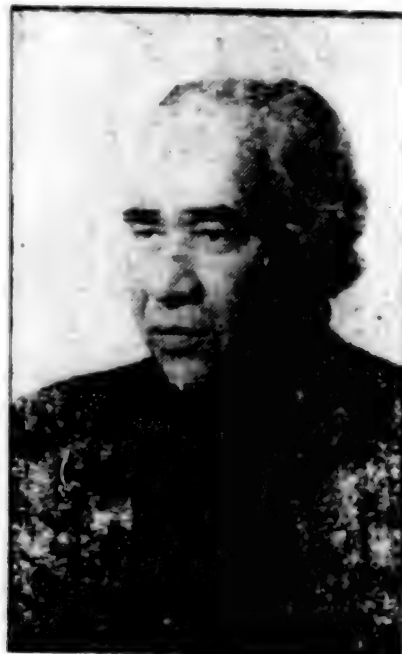
Between 1966 and 1977, as deputy director of the G. Dimitrov Shipyards, and first deputy general director of the Shipbuilding DSO, engineer T. Ganchev successfully headed the practical work on the overall reconstruction and modernization of the plant. He has made a major contribution to Bulgarian shipbuilding as chief designer. Under his management a total of nine designs for ships for the Bulgarian fleet and for export were completed. They include the maneuvering 600-hp tug, a training ship for the naval academy, a 4,200-ton shallow-water tanker, a 5,000-ton dry-freight ship, and others. As a result of the latest modification of the 25,000-ton bulk freighter, a fuel economy averaging 6.6 tons per day was achieved compared with previous models. Efficient designing has led to substantial savings in steel. This ship was awarded a gold medal at the Plovdiv International Fair.

The 15,000-ton general-purpose dry-bulk freighter as well is distinguished by its excellent sailing qualities. A barge for hauling spent nuclear fuel at the Kozloduy nuclear power plant, also designed under the supervision of engineer T. Ganchev, is already operational. The original design of this barge makes it one of the first specialized vessels for such purposes in the world. The design was patented and was issued an authorship certificate. This is the only Bulgarian fully patented vessel.

As a specialist with great theoretical training and practical experience, between 1962 and 1974 engineer Todor Ganchev was in charge of Bulgarian shipbuilding at Section No 4 of CEMA's Permanent Machine Building Commission. Engineer Todor Ganchev was awarded the gold People's Order of Labor in 1969 and the Red Labor Banner Order in 1971.

Engineer Nikola Iv. Kaludov, chief of the production-design department, has been at work at the Shipbuilding Institute for the past 20 years. He was trained as shipbuilding engineer and gained experience and became a specialist at the G. Dimitrov Shipyards, where he worked for nearly 8 years as senior engineer, designer and chief of design bureau department. It was under engineer Kaludov's management that self-propelling 500-cubic-meter barges were designed and built at the Il. Boyadzhiev Shipyards in Burgas. He also supervised the designing of the first container carrier for 400 containers built at the G. Dimitrov Shipyards in Varna.

Engineer Zhecho M. Bliznakov is one of the specialists at the Shipbuilding Institute who was trained at the Leningrad Shipbuilding Institute. His creative and labor career as a shipbuilding engineer naturally developed from the shipyards in Varna, where the young specialist began his work as



Engineer N. Kaludov



Engineer Zh. Bliznakov

master welder, followed by designer at the design bureau and head of the hull department, which he managed for a long period of time. A number of young people developed as good specialists in hull design under his skillful guidance.

Engineer Zhecho Bliznakov has spent a considerable part of his career as chief engineer at the Shipbuilding Institute, where he is in charge of scientific research and design-engineering activities related to new ships. The scientific research sections whose task is to promote the creation of new ships strengthened and developed considerably. During that period the first heavy-tonnage 10,000- and 25,000-ton bulk-freight ships were created. As deputy director of the Shipbuilding Institute, today engineer Bliznakov continues to head the designing of new ships in Varna and in the Ruse and Burgas Institute branches. He is exceptionally concerned with the quality of design, the reaching of high technical and operational qualities and economy. Engineer Zh. Bliznakov is the bearer of the gold and silver People's Order of Labor.

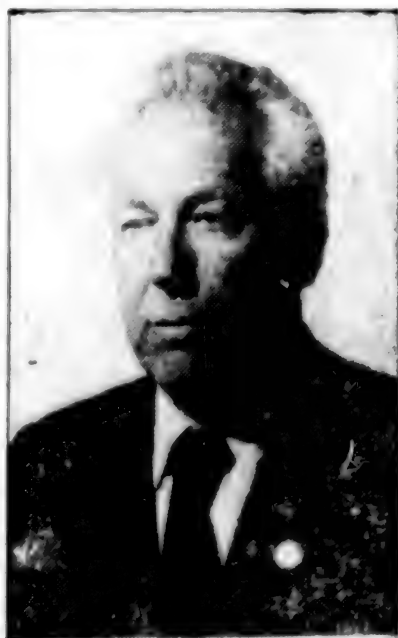


Engineer At. Sirakov

For more than one-quarter of a century of work in shipbuilding, the life of Atanas St. Sirakov, chief designer at the Shipbuilding Institute, has been filled with intensive work on many projects and the urgent search for finding the most accurate and precise solutions in ship design. What are the actual accomplishments of so many years of work? They include managing the designing and building of passenger ships with 100 cabins for the Soviet Union, and a design for a 10,000-ton bulk-freight ship in which modern technology in the block construction of the ship's hull, pre-building berth was applied for the first time in Bulgarian shipbuilding. This reduced by two-thirds the time needed for assembling the hull at the dock. Engineer At. Sirakov also headed the designing of a 38,000-ton ship for bulk freight in two models, the second of which was awarded the "K" rating. The use of modern technology in shipbuilding considerably shortened the construction cycle. The ship is in demand on the international market for its good sailing and operational qualities.

The new "Bononya" railroad ferryboat, which currently sails between the ports of Vidin and Calafat (Romania) on the Danube, was also the work of chief designer engineer Siratov. The ferryboat is an original installation consisting of three separate hulls linked with a common deck. This vessel has contributed significant savings to the national economy. Again under At. Sirakov's management, currently a 3,500/5,000-ton dry-bulk general-purpose ship is being designed. This ship, which will be equipped with powerful loading facilities, will be independent of available port facilities.

The efforts of engineer Atanas Sirakov can be gauged also by the high governmental distinctions such as the gold People's Order of Labor, which he was awarded in 1971, and the Red Banner of Labor order, which was awarded to him in 1981.



Engineer N. Ivanov

Engineer Nikola G. Ivanov, chief project designer at the Shipbuilding Institute, has also permanently linked his life to Bulgarian shipbuilding. He completed his university studies in 1955 and initially worked at the G. Dimitrov shipyards as control foreman, deputy chief of the technical control department and senior inspector at the USSR Registry Inspectorate in Varna. He began work at the scientific research and design-engineering institute in 1966 and worked for many years as chief ship designer. He was head of the designing and construction of a ferryboat for motor vehicles, one of which we may see at the Beloslav Lake while the other plies the Danube River. The 3,000-ton collier built for the USSR, whose construction is taking place at the Iv. Dimitrov shipyards in Ruse, was also designed under the guidance of engineer N. Ivanov. He is also in charge of designing the modification of a 36,000-ton ship. Considerable savings were achieved by changing the type of some of the materials used in the main hull under the new modification.



Engineer T. Tenekedzhiev

Born in Burgas, near the seashore, engineer Todor N. Tenekedzhiev chose a profession related to the sea. He transferred from the State Polytechnic, where he studied machine engineering, to Varna, where he completed his university education as shipbuilding engineer and began his career in 1955. For a while engineer Tenekedzhiev worked as head of the Bulgarian navy workshop. He then joined the design bureau at the Varna shipyards as designer and group manager. In 1962, together with many other specialists, he joined the newly created NIPKIK as department chief. He became deputy chief engineer in 1967 and chief engineer in 1972. Between 1974 and 1981 he headed the Ship Design facility, after which he became deputy director of the Shipbuilding Institute.

Engineer T. Tenekedzhiev is distinguished by his aspiration steadily to enhance his skills and familiarity with new developments in shipbuilding. Initiative and good organizational qualities are characteristic features of his work. He is the bearer of the gold People's Order of Labor.

Today, after 20 years of creative history, we can say that the Shipbuilding Institute has become a prestigious center for scientific research and design-engineering activities in shipbuilding and ship machine building. The ships designed by the institute's specialists are becoming increasingly more competitive and sought on the international market. This is mainly the result of the efforts of those involved in this work.

5003

CSO: 2200/127

NEW PROGRAM FOR IMPROVING CONSTRUCTION INDUSTRY OUTLINED

Prague RUDE PRAVO in Czech 9 Jul 82 p 3

[Text] The Presidium of the CPCZ Central Committee, the CSSR Government and the Governments of the CSR and SSR dealt with meeting goals in the construction industry. Along with appreciation of positive results they subjected to criticism significant deviations in meeting the plan, shortcomings in management, planning and organization of construction projects and in meeting the deadlines for construction, its economy and, in a number of cases, even its quality.

The demanding tasks postulated by the 16th CPCZ Congress call for decisive measures to achieve a basic reversal in the performance of this significant sector in the current year and to restore its dynamics in the subsequent years of the seventh Five-Year Plan. A prerequisite for this is accelerated redress of internal shortcomings in the construction industry and relevant sectors, as well as of shortcomings in planning and management of capital investment.

Construction output increased in the sixth Five-Year Plan by 25 percent. The army of construction workers expended much selfless effort, often under difficult conditions, for the prosperity of our country. Construction was launched in key projects of the fuel and energy complex, long-distance pipelines, the nuclear program, the chemical, metallurgical and machine-building industries and other branches. Construction capacities were gradually concentrated in areas of intensive construction, which increased in the North Bohemian region by 72 percent, in Prague by 38 percent and in Bratislava by 42 percent, and for priority projects. Goals set for subway construction in Prague have been fully met. Putting into operation the planned sections of express highways, new and overhauled highways, electrified track sections and railroad switches created conditions for improving transportation.

With 647,000 new, modern apartments finished, the sixth Five-Year Plan accomplished the highest volume of residential construction ever. The Palace of Culture in Prague and other key construction projects were put into use for health care, education, culture and commerce in all regions.

Equipping construction workers with basic machinery increased during the sixth Five-Year Plan by 50 percent. There were improvements in the material and technical base as well as care of construction personnel.

In spite of these results, good examples of successful projects and exemplary efforts of many construction teams, serious shortcomings are appearing in the construction industry. The 15th CPCZ Congress and, on its basis, the 6th Plenum of CPCZ Central Committee in 1977 pointed out the need for faster adaptation of the construction industry to the new needs of capital investment, improved organization and management of labor in the construction industry and more effective utilization of scientific and technical development and people's initiative.

However, the specified goals were not met in time with adequate conceptual and organizational backup. Under the conditions of continuing excessive unfinished construction and fragmentation of efforts, the construction industry failed to react to the new conditions in time. It failed, and keeps on failing, to meet a number of state goals in required deadlines, efficiency and quality. While the planned volume of construction work on priority projects was on the whole exceeded, only 60 to 70 percent of the specified deadlines for launching experimental operation and for finishing projects were met. The blame for these negative tendencies also accrues to serious shortcomings in investment, planning and supplier preparation of construction projects and their coordination, as well as deliveries of technological and final assembly facilities by the machine-building industry.

There were several serious shortcomings in the quality of construction projects. A continuously high number of defects discovered in turning over projects calls for supplementary expenditures and generates justified criticism.

In regard to efficiency and economic results, there are considerable differences between construction enterprises of an identical or comparable orientation. Differences in the productivity of labor and returns on investment between the construction industry of the CSR and SSR are deepening.

The drop in dynamics and efficiency of the construction industry is due in many ways to subjective causes. Needs of the national economy require that the construction industry improve in meeting planned goals; that it build faster, more economically and with improved quality; that it react more readily to the more demanding conditions of the economy and adapt itself more systematically throughout the system of management, planning, incentives, organization and technical policy to requirements for higher efficiency.

In the spirit of the 16th CPCZ Congress, a stop must be put to unjustifiable increases in budgeted cost of construction projects and, with the given volume of investment means, bringing about an increase in the material volume of operations, thus create the prerequisites for implementation of pressing modernization projects and efficiency improvement programs.

A fundamental reversal in the efficiency of the construction industry calls for substantial improvements in construction investment planning and construction operations, deepening a comprehensive linkage and balancing between investment plans and the structure of construction capacities as well as the needs of territorial distribution of construction projects. Along with it, there is a need for improving the quality of investment and planning preparation of projects, radically decreasing the extent of unfinished construction projects, substantially improving implementation of material and technical logistics and meeting the needs of the construction industry by deliveries from other sectors.

Analyses show that adverse trends in the development of the construction industry are connected with persistence of the long-term extensive orientation of its development. In the building trade (as with industry's meeting gross production quotas) efforts have been concentrated for a number of years primarily on volumetric indicators. That resulted in a one-sided preference for types of construction that were less labor-intensive on the site but, as a rule, led to higher consumption of materials. Enterprises oriented themselves--together with an often contrived increasing of their share of cooperation--toward the easier approach of meeting the plan in the volume of output but at the expense of authentic tasks and economy.

To boost its production volume the construction industry resorted to some extensive factors that must never again be resorted to, particularly highly productive site startup operations at the expense of finishing operations; assembly of apartment complexes before securing the necessary investments, utilities and public facilities for settlements; large-scale application of construction types and technologies that are profitable from the enterprise viewpoint but are demanding and costly in use of materials; and importation of workers to fill building trade shortages.

This development was in many respects made possible and supported, on one hand, by the system of plan indicators and orientation toward the system of incentives primarily in the quantitative aspects and, on the other hand, by the persistent extensive approach throughout the capital investment structure. Pressure exerted by investors and various local authorities on excessive startup of new construction projects, which has been inadequately opposed, led to an unsupportable expansion of unfinished constructions and thus prolonged deadlines.

The number of unfinished construction projects increased, in conflict with the 16th CPCZ Congress, during the sixth Five-Year Plan from 26,000 to almost 29,000 construction projects and the work backlog (volume of operations required for completion of started projects) in the construction industry increased from 2.1 years to 2.6 years. In 1981 an average 20 workers were assigned to building operations per construction projects with only 2.5 workers per structure.

The requirement of the 15th CPCZ Congress to reduce unfinished construction during the sixth Five-Year Plan by 15 to 18 percent was not met; on the contrary, unfinished construction increased by 22 percent. At the same time, effectiveness of long-term production assets in the national economy kept decreasing from year to year in the sixth Five-Year Plan by 3 percent and the number of inadequately used jobs kept increasing.

The construction industry shared in the growth of unfinished construction also by starting--be it in enterprise, various investor or local interests--many smaller construction projects within planned limits by investors, without any prerequisites for finishing by the planned deadlines. Contrary to societal interests, construction enterprises often failed to implement key operations on important construction projects and scattered their capacities on projects of a smaller or local character.

Excessive numbers of simultaneous construction projects and the current diffusion of construction capacities adversely affected the prerequisites for efficient organization and management of construction operations and also adversely affected the working and social conditions of construction personnel. The high level of unfinished construction clearly brought to the fore serious weak points in preconstruction preparation, in logistics for construction projects and also in utilization of working hours and of construction mechanisms, in maintaining work and technological discipline, in material economy and maintenance of order on construction sites.

The overburgeoning system of priorities is of no help in exacting redress. The excessive complexity and useless multilevel hierarchy of project documentation, inadequate coordination of the progress of planning and building operations, cumbersome dealing with arising problems--all lead to unnecessary prolonging the time needed for construction in comparison with conditions abroad.

Party efforts toward accelerated transition of the national economy to a path of intensive development and adaptation to the more demanding internal and external conditions already toward the end of the sixth Five-Year Plan called for more systematically reducing the level of investments, curbing the extent of startups, concentrating capacities of finishing projects and uncompromisingly implementing measures designed to save metals, fuels and energy, propellants and other materials. These correct and necessary measures also exposed shortcomings in the structure of construction capacities as well as in the balance of subcontracts needed for finishing and turning over construction projects.

Serious shortcomings are appearing in the distribution and management of manpower throughout the construction sector. Particularly in the CSR there is a considerable shortage of workers in building trades, primarily in trades like carpenter, bricklayer, mason and welder.

While the number of workers was decreasing the number of technical, economic and administrative personnel constantly increased. This is due to the adverse effects of excessive complexity and confusion of regulations in the area of capital investment, construction output and planning, as well as the relations between individual participants in construction projects. Systems of remuneration are also overly complex, demanding on administration, yet not very effective. Development of the share of workers in building operations is also negatively affected by increases in the number of personnel in housing, food and other auxiliary services that the construction industry must provide for its own needs and, in many cases, also for other participants in a construction projects. Inadequate use is made of opportunities for making these services more efficient, particularly in areas of concentrated construction.

Acquisition of workers, especially for remote construction projects, is also affected by a weaker lead in the level of wages in the construction industry in comparison to other branches. In the past several years this was aggravated by failure to meet the plan and the resulting lower generation and drawing on wage funds in organizations of the ministries of building.

In our entire national economy a sizable army of approximately 774,000 is engaged in construction operations. Organizations of the ministries of both republics employ 341,000, construction enterprises under the jurisdiction of federal authorities and other CSR and SSR departments employ another 86,000. Local construction accounts for almost 111,000 workers and national enterprises highways and road construction employ 22,000.

In addition, construction operations are engaged in by another approximately 214,000 persons in organizations other than building and construction (in addition to some specialized building assembly enterprises, they include mainly construction crews of industrial and agricultural enterprises and unified agricultural cooperatives, construction cooperatives, maintenance crews of OPBH [expansion unknown], etc.). Even though these organizations perform some important functions, increases in the number of their workers at the expense of the centrally controlled construction industry, in some cases even their wage policy practices and other factors, become adversely reflected in weakening the construction organizations carrying out key tasks in development.

We must create the prerequisites for overcoming the undesirable high fluctuation in the construction industry and adopt measures for stabilization of, especially qualified, workers in construction enterprises. With the outset of the seventh Five-Year Plan, in spite of implemented measures, the mentioned negative trends failed to be satisfactorily opposed. The ministries of building of both republics in 1981 failed to meet a considerable extent of their tasks.

The plan for 1982, while specifying the volume of construction operations, already is taking into consideration the intended changes in the structure of development. It heeds the inevitability of substantially higher savings in propellants, fuels and energy as well as basic materials for building. It

follows up on the first results obtained in the effort to cut down on unfinished construction of 1981 (arrears in budgetary costs for unfinished construction registered for the first time a mild decrease--11.3 percent) and is creating the prerequisites for continued reduction of unfinished construction in the current year (12.7 percent).

The total volume of construction operations carried out by their own personnel is for that reason planned 4.2 percent below last year's level. By its internal structure and emphasis on qualitative aspects, the plan for the current year represents, in spite of the mentioned reduction in the total volume of construction operations, a task extraordinarily demanding on all levels of the construction industry. It calls for comprehensive and effective mobilization of internal unused resources in the construction industry and for increased efficiency by utilization of intensive factors. At the same time it envisions a high degree of mutual cooperation among investors, planning, building and supply organizations.

The more urgent and pressing appears the requirement on the construction industry's accelerated making up for the outages that occurred in the winter months of this year. The Presidium of CPCZ Central Committee, the federal government and governments of both republics, on the basis of a critical analysis of the situation in the construction industry, expressed their opinion that it is possible to rectify the situation thoroughly, provide for reliable and quality meeting of specific needs of development, and do so without importing construction capacities and trades. This calls for--as emphasized by the 15th CPCZ Congress--a more realistic and effective capital investment and, in keeping with the requirements of scientific and technical development, a systematic subjugation of its structure to the changes occurring in the national economy, as well as adoption of specific, effective measures for improved management of investment policy and systematic control of their implementation.

In keeping with this the governments adopted measures to meet the plan for the construction industry in 1982. They prescribe specific, quantified tasks for construction organizations of the ministries of building (which were broken down for VHI [economic production units] and enterprises). All efforts must be concentrated on implementation of the following goals:

1. making up for winter's outages in meeting the plan so that construction enterprises of the ministries of building achieve the prescribed quarterly shares of the annual volume of construction operations while systematically carrying out assigned tasks, particularly requirements on completion of construction projects;
2. achieving a decisive increase in efficiency of the construction industry in the summer months by organizing prolonged shifts, two-shift operations, 10-day cycles at priority construction projects and other measures designed to maintain daily output at the June level in July and August, and adopting timely organizational measures for maintenance of effective operations on construction sites in winter months.

3. concentrating construction capacities on mandatory and other priority projects as well as on sites scheduled for completion in the current year; taking effective steps toward reducing unfinished constructions; shortening deadlines for construction; and increasing the capacities of the finishing cycle;
4. providing for priority development of the fuel and energy base, primarily by unconditional carrying out assigned tasks in the construction of nuclear powerplants, important construction projects in other sectors as well as assigned tasks in priority areas of concentrated investment construction in the North Bohemian region, in Prague, in Bratislava and in the conurbation of Ostrava;
5. providing for meeting tasks of comprehensive residential construction and improving the quality of construction of apartments, public utilities and facilities.
6. intensifying construction output primarily by technical development and savings in the consumption of fuels and energy, metals and construction materials, wider implementation of flow-type construction [TN: could also mean "electrification"] and improved utilization of mechanisms with an accelerated rate of putting out of operation obsolescent and wornout machinery;
7. adopting measures for effective utilization and improved structure of personnel in the construction industry, particularly by reinforcing selected trades (mason, carpenter, concrete layer, bricklayer, welder) and reducing the number of personnel in administration and other auxiliary sectors;
8. emphatically improve management and logistics of specific construction projects; through higher utilization of working hours creating the prerequisites for higher output and higher average wages;
9. devising comprehensive measures without delay to stem reductions in the number of workers at construction projects in organizations of the ministries of building and their stabilization at key construction projects; and
10. to reinforce the principle of pay according to merit and a more effective utilization of the system of incentives, expanding application of unit-oriented task wages and introducing brigades and work teams with their own khozraschet; increasing the role of substantive involvement in key qualitative tasks; and meeting construction deadlines as well as multi-operation.

In the interest of creating better conditions for the transfer of personnel to remote sites, there will be a unification of the system of remuneration of construction personnel working away from home, unable to commute daily to their family.

The key problem in improving the organization and management of building is a substantial and accelerated decrease in unfinished construction and the number of simultaneously conducted projects. Thorough arrangements must be made for budgetary coverage of conducted construction projects by capacities of the requisite structure, as well as supply of construction materials, machinery and equipment to provide for continuous flow of construction.

An important step toward reducing unfinished construction is a substantial decrease in the planned extent of newly launched construction projects in the seventh Five-Year Plan, as decided by the CPCZ Central Committee and the CSSR Government. Remedying the current unsatisfactory state in unfinished construction will also call for temporary suspension of selected less important projects. As assessments so far have produced only minimal, highly unsatisfactory results, it will be necessary to implement much more decisive, comprehensive steps this year, in connection with working out plan proposals for 1983 and subsequent years.

Building enterprises must optimize their output plans so as to provide for meeting assigned tasks while substantially limiting the number of simultaneously conducted construction projects and shortening construction deadlines. On principle must be condemned the harmful practice of including the plan and commencing construction projects without the requisite planning preparation and securing of materials and capacities, as well as cases where implementation of individual stages becomes protracted over many years.

Construction organizations are obligated to carry out first of all priority and government-monitored projects and those scheduled to be put in operation in the current year. Only then can they take over tasks in other projects. Heed must also be paid to using specialized construction organizations outside the construction sector and construction units of other than construction organizations for their intended purpose.

The measures adopted for improving the situation in the construction industry--with a view to specific conditions--must be systematically implemented in construction organizations under the jurisdiction of departments other than the ministries of building. Particular attention--in the spirit of the resolutions of the CPCZ Central Committee Plenum regarding the activities of national committees--must be paid to local construction, reducing its extant disproportionate share in investment construction and implementing basic changes in its closer orientation on maintenance, repairs, overhaul and modernization of buildings, particularly in the apartment sector, and development of construction services for the populace.

Together with implementation of the plan for the current year it will be necessary to create comprehensive prerequisites gradually for an overall increase of efficiency and effectiveness of the construction industry in the 7th Five-Year Plan. That--in the spirit of the resolution of the 16th CPCZ Congress--calls for a more systematic approach to dealing with the problems of structure and distribution of capacities as well as development of technical policy, the material and technological base and the construction management system.

Detailed directives have been issued in regard to working out these conceptual problems. They include primarily tasks for implementation of needed changes in the structure of construction capacities to make it comply with the changed requirements in the plan of capital investment. Among other things, the emphasis is on accelerated reinforcement of capacities for finishing construction projects.

Planning and construction must be oriented toward economical, efficient designs and technologies that promote higher utilization of the domestic raw material and other materials base and lower demands on imports and the requirement for a fundamental improvement in the thermal insulation and acoustic properties of buildings. In the interest of saving fuels and reducing demands on transportation it will also be necessary to bring more efficiency into extraction and transportation of earth and soil. Attainment of this goal will require assessment of the planning documentation for ongoing and scheduled construction projects.

It will also be necessary to adapt to the new needs the material and production base of construction output and to promote industrialization of the building trades. An ongoing task is reduction of the extent of hard and strenuous labor and improvement of the working conditions of builders. Ministries of building must develop in cooperation with machine-building departments a program for providing the construction industry with additional requisite technology. Particularly needed is an improved level of mechanization, mainly finishing operations.

Development needs also call for an accelerated development of production and deliveries of finishing machinery products and systems for construction projects, particularly boiler rooms, air conditioning, fittings and fixtures, distribution systems, etc. Further development of measures for improved planning and management must be oriented toward a deeper harmony among the interests of the investor, the builder and the supplier. The decisive criterion for evaluation of construction enterprises must become carrying out of assigned tasks, meeting of deadlines for completion of construction projects and complexes, and their quality. The number of other indicators should be reduced accordingly.

The thing to accomplish throughout the construction sector is to implement basic measures for systematic application of khozraschet principles in VKhI and enterprises down to individual construction projects. The foremost task is systematic creation of conditions for wider application of viable forms of motivation, particularly task and piecemeal wages and introduction of khozraschet at brigade level. It is one of the key tools for ensuring of full utilization of working hours, better utilization of machinery in time and output and increased fuel, energy and material economy as well as maintenance of order and work safety on building sites.

It is the duty of construction organizations to increase the level of preparation and production preparation for construction projects and to apply the system of viable norms regarding the consumption of labor value added and labor contents of energy, fuels and materials. A basic turnaround

must be achieved in the quality of construction operations. Updating a comprehensive system of quality control must be tied in with the system of intraplant management, particularly with the system of incentives.

A key role in improving the management of construction projects is played by foremen and site supervisors. For that reason it is necessary to increase the demands on their performance, to improve the quality of cadre selection and increase their qualifications systematically. However, at the same time there is a need for supporting their authority, expanding their jurisdiction and responsibility and also their economic stake and social standing.

It is imperative to bring much more efficiency into the system and simplify regulations in the area of capital investment, planning, building, the system of record keeping and remuneration. There is a need to use the great unused resources for economizing construction that exist both in the area of implementation and in investment and planning activities. Conditions for application of efficient methods of building must be created in planning tasks and in initial planning in order to facilitate transfer of project documentation from planning to construction supply organizations.

Implementation of the tasks of the 16th CPCZ Congress requires that it be headed by communists in key positions, be it in social organizations, party organs or organizations. It is imperative to require from controlling authorities a stronger sense of purpose and activity in overcoming shortcomings and creating conditions for improved performance in the construction industry and flow of construction.

Territorial party organizations also have an obligation to resist actively improper attempts of individual investors to include in the plan projects that have been neither prepared nor backed up materially and wage an active struggle for reducing the extent of unfinished construction, reinforcing state discipline in the construction industry and in capital investment as a whole.

Regional and district committees of the party must use their political, organizational, ideological indoctrination and cadre and control activities to help improve the situation in the construction industry. We must continue to form all-plant committees in construction organizations and establish at key construction projects on a wider scale all-site committees. Party organizations should also pay increased attention to their activities in local construction. Formalism must be resisted during party control days on construction sites, the project must be adequately prepared and bring tangible results.

Reinforcement of party influence calls for devoting increased attention to the growth and qualitative improvement of the membership base, particularly among workers engaged in construction, and increasing the share of party members who hold the posts of foremen and site supervisors.

in cadre work high demands apply to key personnel, their political and professional readiness, creative involvement, high moral quality and capability to lead work teams. Supervisors who categorically insist on performance are to be supported.

A task of party organs and organizations that will tolerate no delay is intensive political work with the technical intelligentsia, promoting active participation of personnel engaged in preproduction stages and planning who decisively influence the economy and efficiency of building, savings of fuels, energy, propellants, materials and labor.

Leading managerial personnel must systematically create technical, material and organizational conditions for a smooth flow of on-site operations. In cooperation with party, trade union and youth organizations they must develop active participation by the workers toward meeting the plan, particularly in the summer months, as the basic prerequisite for meeting the plan for the entire year.

In connection with the resolution of the 10th All-Trade Union Congress, officials of the Revolutionary Trade-Union Movement are charged with the important task of organizing, in cooperation with management, a systematic development of work initiative and socialist competition oriented toward the key assigned tasks of the state plan, toward quality and economy. They must actively support application of progressive innovative methods, particularly the Zlobin contract teamwork method, brigade-level khozraschet and the inventor movement, as well as see to it that suggestions and recommendations of workers made during production consultations are systematically used. In the struggle for strengthened work discipline, for full utilization of working time, for wide application of task and piecemeal wages and in their struggle against displays that tarnish the good name of builders, they can rely on the major part of honest and selfless workers in the construction industry.

Hand in hand with the efforts to improve efficiency must be stepped-up care and provision of the social, material and cultural needs of workers, particularly in areas of concentrated construction. On the basis of an analysis of past development, comprehensive programs for social development must be worked out for 1982-1985, dealing with tasks for restructuring of jobs and trades, apprentice training, creation of conditions for meeting the social, health, cultural, working and living needs of all.

In cooperation with the organs and organizations of the Union of Socialist Youth it will be necessary to provide all-round support to development of the initiative of young workers, persuade them to participate in work on socially important construction projects and instill in them pride in achieved accomplishments and loyalty to the builder's trade.

Our builders made significant contributions to the successful development of socialism in our country. That justifies a conviction that they will also carry out with honor the new demanding tasks promulgated for them for the 1980's by the 16th CPCZ Congress.

INCREASED EXPORTS BY USE OF 'EXPORT FACTOR' VIEWED

Prague PLANOVANE HOSPODARSTVI in Czech No 5, 1982 pp 79-84

[Article by Frantisek Novak and Eng Jiri Bidrman, Jablonec Custom Jewelry VHI (economic production unit), Jablonec: "Partial Results of the 'Export Factor' Experiment"]

[Text] One of the principal aims of the national economy is to increase effectiveness of external economic relations that should create prerequisites for a favorable balance of payments, which is becoming increasingly important as the key criterion for balancing society's needs and resources.

The 18th Plenary Session of the CPCZ Central Committee as well as the 16th CPCZ Congress stated that the principles of the improved system of planned management must be more strictly enforced, particularly in regard to increasing effectiveness of exports. For this reason, we asked ourselves whether the present plan indicators and categories of economic tools contributed to increasing exports and whether their impact on production and PZO's [foreign trade enterprises] was identical.

A more detailed analysis of plan indicators and of systems measures has revealed that both spheres (production and foreign trade) are managed relatively independently without closer economic interlinking. The key indicators of the improved system of management (total production costs, profit, return on production assets, labor productivity, inventory turnover) are based on the criteria of the domestic economy; that is, wholesale prices (VC). As to their effect on dynamics and effectiveness of exports, they are neutral or may, under certain circumstances, in fact act against the export interests. For production from the standpoint of khozraschet, the most important are the domestic wholesale prices from which these indicators and thus also the funds of enterprise financial incentives are derived. The (F.O.B.) prices fetched abroad and the export margin indicator (RU) are reflected in these incentives as supplementary only in the form of the qualifying indicator for the wage regulation and through export incentives.

Moreover, the wholesale prices do not, and as of now cannot, serve as the objective criterion for comparing the quality of our products with world exports. As a result, to a certain extent a paradoxical situation arises. If the PZO's exporting primarily to the nonsocialist countries comply with the demands of foreign customers for more elaborate products, involving extra material and

wage costs, in terms of domestic VC they often sustain a loss, although the price fetched abroad is favorable.

From the standpoint of economic tools, the situation in foreign trade organizations is more favorable. The collection and export plan, broken down into the nonsocialist and socialist countries at F.O.B. prices, and the RU are virtually the principal plan indicators. The export margin indicator represents (despite all defects and limitations) the qualitative criterion of exports' effectiveness. Through it, PZO's are linked to the wholesale prices of production enterprises. As evident from a number of analyses at the enterprise, VHI and ministerial level, the intensity of the effect of economic tools--even under the conditions of the improved system of management--is different in production and foreign trade.

Moreover, we asked ourselves whether the equal pressure exerted by the superior organs for increasing all three export indicators (VC, F.O.B. prices and RU) from the standpoint of effective foreign commodity exchange is correct, to say nothing of practical demands of superior organs (both the ministry and SBCS), which sometimes emphasize increasing exports at wholesale prices.

Under the present conditions of limited raw materials, energy and labor force resources, and in order to underline the function of the balance of payments as the basic criterion, it is necessary to lay principal emphasis on the export margin indicator in the first place, whose growth rate should exceed the dynamics of worldwide inflation reflected in the constantly increasing import prices, then on the F.O.B. prices indicator and only in the end on the VC indicator. The constant increase in the RU rate is extraordinarily important for the balance of payments. The choice of the assortment and of territories and eventually also the orientation of technical and technological innovations by VHI and PZO must be subordinated to it.

The "export factor" experiment was based on the principle that the more rapid the increase in exports at the prices quoted as all charges paid to the border in comparison with the exported goods at wholesale prices--this is reflected in the growth rate of the export margin indicator--the more favorable is the situation for the balance of payments is. For this, VHI as well as the enterprises should enjoy certain advantages. This would be a preferential treatment similar to those enterprises and VHI, which under the improved system of management charge higher prices for fashionable and luxury products. Fetching an advantageous price abroad in the fierce international competition of the world markets is, in view of the present price and foreign exchange rate policy, incomparably more complex but more advantages and more effective for society.

#### Brief Characteristics of VHI

The Jabloner Custom Jewelry concern is an economic production unit of six concern enterprises (kp) and two special-purpose organizations. The concern enterprises manage 33 plants and approximately 380 local production units, including cottage industry outlets, in almost all krajs of the CSR and SSR.

The VHI production program is rather extensive. It comprises 42 production lines, 280 planning centers, 8 local items and hundreds of thousands types of

products. From the standpoint of importance, profitability and export effect, commodity production is divided into key, constantly increasing production (custom jewelry, lighting fixtures and illumination glass), developing (particularly flowers), stagnating and phasing-out production.

The key sector--custom jewelry--is fashionable and seasonal merchandise that must be innovated at short intervals. Its assortment consists of several hundred thousands of various products; tens of thousands of slightly modified or innovated types are added every year. Custom jewelry can be essentially divided into glass (with a subgroup of stones) and metal custom jewelry.

The Jablonec Glass Works kp carries out basic metallurgical production and processes seed pearls and stones (rocaille). Processing of other custom jewelry is concentrated in the concern enterprises Zelezny Brod Glass and Preciosa (stones). Metal custom jewelry is manufactured at the Custom Jewelry concern enterprise.

The second biggest key sector is lighting fixtures, whose increased manufacture depends upon the available supply of metal parts, cut glass adornments, chains and chandelier components.

The total production of the concern is predominantly directed to exports. Exports account for 55.9 percent of total sales. Approximately 33.4 percent of exports are shipped to the nonsocialist countries. These exports are considerably effective. The export margin indicator is 134.78 for all exports, 136.01 for export to the nonsocialist states and 132.96 for export to the socialist countries. In the key sector of custom jewelry, RU in 1980 was 139.56 for SZ [socialist countries] and 153.25 for NSZ [nonsocialist countries].

In sharp contrast to the high proportion of exports in total production is the small proportion of imported raw and industrial materials necessary for the manufacture of glass and custom jewelry. The noninvestment imports account for only 2.98 percent of commodity production.

The custom jewelry industry employs a large labor force. Most of the customers, particularly in foreign countries, usually select the most elaborate products from the collections offered but are also willing to pay a corresponding price for them.

One of the characteristic features of our VHJ is the employment structure. Of 26,318 workers 66.2 percent are women. Those working in their homes are a special group. Cottage industry makes use of the workers who because of the impossibility of moving to another locality, their age or social reasons cannot be employed in other industrial production. We also employ foreign workers. Although our labor force is distributed throughout almost all krajs of the CSSR, most is in the Jablonec-Liberec area (62 percent).

The big effect of the custom jewelry sector on the foreign markets is due, as mentioned, to the bigger proportion of manual labor. Its replacement by machine production did not proportionately increase the effect because expensive domestic or imported equipment contributed to the higher production costs. For this reason we want to build our own engineering capacities gradually.

## Essence of the Experiment

The goal of the experiment is to increase shipments for export by achieving more dynamic increases in foreign prices, exceeding inflation in the markets of nonsocialist states and average increases in the contracted prices in exports to the socialist countries. The above-average increase in effectiveness of exports and the increases in their material volume should contribute, in the group of products whose manufacture requires only a small amount of imported materials, to an improved balance of payments.

Effectiveness of exports is being, and will be further, increased particularly by the application of technical achievements, better quality, innovation of products, optimization of the assortment as well as of the territorial structure, more efficient processing of raw and industrial materials, improvement of merchandising and management methods, and reconciliation of economic interests of production organizations with those of PZO's, particularly Jablonex and Sklo-export.

The conceptual experiment does not change the generally valid methods of planning, financial tools in the production and foreign trade sectors, accounting, statistics or reporting. It emphasizes the method of evaluation of plan fulfillment, stronger concern, and personal and enterprise incentives by linking them to export results and hard currency incentives.

The criteria for the evaluation of the plan as well as financial incentives are the general indicators modified by the "export factor," which reflects the contribution of the organization to increasing export effectiveness. The output and profit indicators as well as the indicators underlying their calculation will be adjusted separately from the routine accounting and statistical records.

By the output indicator is particularly meant gross production, commodity production, output, value added, adjusted value added, total sales, and shipments for export to the socialist countries and nonsocialist states at VC.

Among the indicators underlying the calculation are particularly the share of total costs in the output, the share of material and other expenditures without depreciation allowances in the output, return on production assets, inventory turnover, labor productivity in relation to gross production, and adjusted value added.

The total effect from exports is the sum of partial effects from exports to the socialist and nonsocialist states. It is calculated according to the formula to which we gradually arrived. In cooperation with the glass and ceramics sector and PAM [expansion unknown] department of the Ministry of Industry, we used the following formula for the wage regulation already in 1979:

$$EV = (Fco_1 - VC_1) - (Fco_0 - VC_0)$$

in which EV is the export factor;  $Fco_1$ , exports to NSZ and SZ at  $Fco$  [all charges paid] prices during the period in question;  $VC_1$ , exports to NSZ and SZ at wholesale prices during the period in question;  $Fco_0$  and  $VC_0$ , the corresponding values of exports during the same period of the previous year.

Following is the new, more precise formula:

$$EV = Fco_1 - (VC_1 \times RU_0 \times I)$$

in which EV is the export factor;  $Fco_1$ , shipments for export in the current year at  $Fco$  [all charges paid] prices;  $VC_1$ , shipments for export during the current year at VC;  $RU_0$ , export margin indicator achieved in export during the previous year ( $RU = \frac{Fco_0}{VC_0}$ ), I, index determining the minimum necessary annual

increase in the export margin indicator during the current year as compared with the previous year (in relation to SZ the index corresponds to the average increase in the contracted prices).

The indexes determining the minimum necessary annual increase in the export margin indicator are specified separately for exports to the socialist and non-socialist states by the appropriate superior organs (State Planning Commission, the federal Ministry of Finance) in individual years of the Seventh Five-Year Plan or by the guideline for preparation of annual operations plans so that the conceptual experiments can be used for counterplanning.

The rules of the conceptual experiment anticipate the enactment of measures designed to prevent the undesirable, and for society not beneficial, increase in exports to the detriment of shipments for the domestic market. Selected shipments for consumer goods inventory, manufacturing consumption and sales organizations are specified as mandatory tasks for the evaluation of plan fulfillment, wage regulations and annual special compensations for management economic personnel.

#### 1980 Results

The experiment, due to delays in determination of the inflation curve and to increases in the contracted prices, actually started in the second half of 1980 and was not, in concert with the CSR Ministry of Industry, detailed in 1980 for the concern enterprises, among other things also because certain methodological questions had to be clarified. After 1980, it was stated that the period of the experiment was too brief for a comprehensive evaluation. The experiment was therefore extended with the proviso that it would also be carried out in the enterprises and plants in 1981.

Nevertheless, the results demonstrated that the Jablonec Custom Jewelry concern (KJB) achieved an above plan and above-average growth rate in the export margin indicator both in relation to the nonsocialist and socialist states in 1980. The export plan at F.O.B. prices was surpassed in both relations (by 11 percent to NSZ and 2.4 percent to SZ), while VHJ improved the foreign exchange situation in the sector without bigger imports through the reduction of labor force and of fuel, energy and raw materials consumption. This was reflected in the reduced quantity of exported goods at the wholesale prices. The general results of the export factor experiment are evident from the following comparisons:

Indicator in 1980 methodology	Plan fulfillment (%) without export fac- tor experiment	Plan fulfillment (%) including export factor experiment
Commodity production	99.1	105.6
Output	100.9	107.3
UVV [Adjusted value added]	100.7	112.2
Export to SZ at VC	105.1	114.4
at F.O.B. prices	111.0	111.0
Export to NSZ at VC	92.2	104.6
at F.O.B. prices	102.4	102.4
Profit	103.8	165.4

#### Export factor in %

Total, in terms of output value	6.3 %
Value of exports to SZ at VC	8.8 %
Value of exports to NSZ at VC	13.4 %

Allocations to funds (million Kcs)	without experiment	with experiment
Special compensations fund	17.0	26.5
including wage regulation	2.2	8.6
Fund for cultural and social needs	14.8	14.8
Development fund	1.0	1.3
Export incentive fund	33.2	33.2

The evaluation of the relation to the nonsocialist states reveals that the 92.2 percent fulfillment of the export plan at wholesale prices was surpassed 2.4 percent at F.O.B. prices, while RU increased 15.48 percent. There was an increase in the quantity of the most elaborate, most profitable export goods (at VC) of custom jewelry and chandelier adornments, which points to the initial success of the experiment.

In relation to the socialist countries, the plan was surpassed 5.1 percent at wholesale prices, while the value in F.O.B. prices increased 11.0 percent and RU 12.22 percent. Increases were registered particularly in lighting fixtures and chandelier adornments.

The total export factor in relation to the nonsocialist and socialist states (6.3 percent of the output value) significantly helped us meet the indicators and thus also the evaluation of enterprises and their financial incentives, although it must be emphasized that we met most of the indicators even without the export factor.

Only the basic allocation in the amount of Kcs 17 million was transferred to the compensation fund. A bigger allocation resulting from the experiment could not be made because it was offset by the penalties paid.

The allocations to other funds with as well as without the export factor were either the same (export incentive fund, fund for cultural and social needs) or could not be increased because of lack of funds for distribution (development fund).

The export experiment began to motivate our operations in 1980, particularly by changing the assortment and territorial structure, reflected in the above-average increase in the export margin indicator.

#### 1981 Results

The positive effect of the experiment in all concern enterprises was favorably reflected in the fulfillment of planned tasks by the Jablonec Custom Jewelry in 1981. In the area of export indicators, excluding the export factor, 101.5 percent of the planned exports to the socialist countries was fulfilled at wholesale prices and 102.8 percent, at F.O.B. prices. In relation to the non-socialist countries the planned volume was attained for the first time in a long time--100.2 percent at wholesale prices and 101.4 percent at F.O.B. prices. After the export factor was included in the calculation, the fulfillment at VC was even higher in both relations--107.7 percent for the socialist countries and 109.1 percent for the nonsocialist states. The export factor at wholesale prices was 6.1 percent for the socialist countries and 8.9 percent for the non-socialist states.

After almost 2 years' experience, the export experiment has intensively affected the RU by the changes in the assortment and contributed to the prompter and more willing compliance with the demands of foreign customers, which in turn helped PZO's to revise the territorial structure of exports more favorably. A negative aspect appears to be that the experiment was not applied simultaneously in our two biggest export PZO's--Jablonex and Skloexport--until 1981. This will happen this year.

The experiment has so far exerted insufficient influence on technical development, technological innovations and higher-order innovations in general. In the interest of an objective evaluation, however, it must be stated that this situation is much more complex. It is closely related to the number of development and research workers, to the possibility of obtaining the documentation for technological innovations on the foreign markets, to the achieving of technical improvements despite limited respective production capacities and so on.

The experiment will be extended to include some selected VHJ's this year. At the same time, discussions were held with the superior organs on the methodological clarification of the profit allocation to individual funds. The export factor resulting from the experiment when it is taken into account, increases the profit but does not produce additional resources. According to the present rules governing the production and distribution of the export incentive fund, it is possible to subsidize the profit, if necessary, from the VHJ reserve fund for allocations to individual funds (special compensations fund, fund for cultural and social needs, development fund) so that the allocations can be linked to the fulfillment of the profit plan and other indicators, including the experiment.

In the area of wage regulation we demand that the limited allocation to the special compensations fund amounting to 2 percent of payable wages be applied to the allocation from the export incentive fund, to the allocation from

current innovations with the proviso that the money saved by the relative reduction of wage costs be transferred to the special compensations fund only, if there are available funds from the distribution (including the subsidies from the reserve fund), as the general rule for other VHI's (in the experiment the amount of transfer to the special compensations fund was limited to 2 percent, including the savings on wage costs).

We presume that after the experiment is introduced in other selected VHI's we will gain more practical experience with its application, which could be generalized. It will then be possible to approve and carry out in 1983 some modifications that will make the international commodity exchange more effective and link it more effectively to the overall economic results of enterprises and PZO's.

10301  
CSO: 2400/330

## CZECHOSLOVAKIA

### BRIEFS

CSSR-INDIA TRADE SESSION--A joint protocol signed by CSSR Minister of Trade B. Urban and Indian Minister of Trade S. Patil in Prague on 5 September concluded the [10th] session of the Czechoslovak-Indian Committee for Economic, Commercial and Scientific-Technological Cooperation. Considered during the meeting was the possibility of producing heavy metalworking machinery, textile and printing machinery, and expanding the existent production of Zetor tractors in India under a Czechoslovak license. The Indian representatives submitted a proposal for increased exports of finished goods to the CSSR. [Prague SVOBODNE SLOVO in Czech 6 Sep 82 p 1]

FIRES INCREASING IN CSR--During the first six months of 1982 there were 2,047 fires in Czech lands, 1.3 percent over last year's figure. Losses caused by fires rose to Kcs 89,728,200, almost a 60-percent increase. [Prague LIDOVA DEMOKRACIE in Czech 9 Sep 82 p 4]

CARDIOVASCULAR DISORDER STATISTICS--Approximately 6 percent of Czechoslovak populace suffers from cardiovascular disorders, half of these receiving full medical retirement benefits. About 110,000 children have heart diseases in the CSSR. [Prague SVOBODNE SLOVO in Czech 6 Sep 82 p 1]

CSO: 2400/367

PREVIEW PROVIDED ON EXHIBITS PLANNED FOR LEIPZIG FALL FAIR

East Berlin AW-DDR-AUSSENWIRTSCHAFT in German Vol 10 No 34, 4 Aug 82 pp 1-2, 7-8

/Article by Information and Public Relations Department, GDR Ministry for Foreign Trade: "Leipzig Fall Fair 1982: Leipzig Again International Trade Center and Pace-setter for Worldwide Economic Cooperation--Favorable Impact on International Trade Climate Expected--Top Quality Products of Combines Show Export Power of the GDR--Scientific-Technical Program Supports Trade Activity"/

/Text/ The Leipzig Fall Fair will take place 5-11 September 1982. Attendance by some 6,000 exhibitors from about 50 countries underlines Leipzig's standing as a world trading center and impetus for worldwide economic cooperation and the exchange of scientific-technological information.

In conjunction with a comprehensive scientific-technological program the international investment and consumer goods offering on a 290,000 square meter exhibition space provides many opportunities for the study of new technical developments. Top quality products of GDR industry demonstrate the dynamism of our economic development and will reinforce the GDR's reputation as an attractive trading partner.

The 1982 Leipzig Fall Fair will be useful to everybody interested in peaceful trade. With the slogan "for free world trade and technical progress" the meeting of business persons from East and West as well as of 300,000 visitors from some 100 countries will have a favorable influence on the climate of international trade.

Extensive International Equipment on Offer

The tone is given by the internationally represented sectors chemical industry and its subgroups agricultural chemicals, chemical plant; plastics machinery and the subgroup of the same name; textile machinery/shoe machinery with the subgroup progressive textile equipment; printing machinery; woodworking machinery and tools; medical and laboratory equipment; road vehicles.

Among the main points of each Leipzig Fall Fair is the sector chemicals, chemical plant and plastics machinery. It demonstrates outstanding international participation with about 800 manufacturers and exporters from 25 countries. At 31,000 square

foot of fair space it occupies about 20 percent of the exhibition area on the fairgrounds. The attendance of prominent chemical enterprises and chemical plant suppliers from East and West reflects the great international reputation enjoyed by Leipzig in the circles of the chemical industry and trade. The chemical industries of all European CEMA countries, for example, are well represented.

The major international chemical corporations from the capitalist economic region are among the permanent exhibitors. Many thousands of products from more than 600 goods groups are available to the users of chemical products. The Fall Fair offers scope for the first introduction of new items to the combines of the GDR chemical industry.

Another large group of exhibits may be inspected in the sector textile and shoe machinery. Well-known exhibitors from 18 countries present many new and improved items in all sectors of the manmade fiber, textile, hosiery and clothing industries as well as machinery for laundries and dry cleaners. A broad international offer is presented also with regard to medical and laboratory equipment. Here exhibitors from 18 countries are involved. The simultaneous presence of pharmaceutical enterprises in the branches household chemicals, cosmetics and pharmaceuticals proper guarantees excellent business opportunities. In the road vehicle industry, exhibitors from 17 countries demonstrate their response to the current demand for highly efficient transport equipment and transport rationalization.

#### Consumer Goods From 40 Countries

Exhibitors from more than 40 countries are displaying high-quality consumer goods, broken down into 20 branches. Some 40 percent of the exhibition area are devoted to this specific assortment.

Among the key industries in the consumer goods sector are glass and ceramics, leisure and recreational as well as sports equipment, including GDR-EXPOVITA. The relevant statistics mention exhibitors from 14 and 11 countries respectively.

The heaviest international representation is provided by the essential and nonessential food industries, assembling firms from 32 countries. Foreign exhibitors account for around two thirds of the fair area. Export assortments from 19 countries are offered in the branches household chemicals, paint and varnish, cosmetics and pharmaceuticals. Other large international representations are recorded for household appliances and toys, attended by foreign trade enterprises and manufacturers from 17 countries, and for furniture exhibited by firms from 13 countries.

Traditionally exhibits of textiles and clothing in the Ring Fair Building have provided the star attraction. Some 800 exhibitors from 28 countries are offering attractive export programs on about 18,500 square meters. The SPJ goods groups represented range from textile raw materials to high-fashion ready-to-wear.

#### Broad-based Availability of Equipment Offered by GDR Combines

The exhibits offered by GDR industry once again confirm the growing efficiency and export strength of our combines. High-quality products and processes reflect the creativity of GDR working people.

The equipment on offer increasingly emphasizes plant and processes that combine the greatest possible productivity with economical energy consumption and efficient materials utilization. The role of microelectronics as the factor determining productivity is reflected in many products.

New machines and equipment with an advanced extent of mechanization and automation for textile manufacture decide the image of the textile machinery on display. More than a third of the exhibits presented by the Textima Combine VEB are new or improved items. Almost 60 percent of the exhibits demonstrate the results achieved so far in the use of microelectronics and electronics for control and regulatory processes. Some of this equipment is shown in a special electronics center. The outstanding control and regulatory equipment is represented by, among others, devices for the optical scanning of fabric edges as well as devices to control and regulate exhaust dampness and residual dampness in fixed-frame drying machines, optoelectronic slubbing controls that check flies and ascertain and process output data. The chief item in the Textima display of machines for yarn production is the new reeling machine for coarse PA silks, the model 2063. By comparison with its predecessor, reeling output is increased by 50 percent.

Microelectronics are represented by many exhibits sent by the Werner Lamberz Polygraph Combine VEB. It takes on control and supervisory functions and thereby ensures, among others, the greater capacity utilization of the machines by lowering idle and resetting times, the manufacture of more and qualitatively improved products coupled with less waste and, not least, much easier operation. The high-speed galileines of the Srypa series use digital controls and are equipped with electronic automated feeders based on microcomputer controls as well as IC [integrated circuit] beam grid barriers. The digital control used allows an up to 80 percent time saving in programming.

Typical for the new and improved plastic machines produced by the Herbert Warnke Processing Equipment Combine VEB of Erfurt are greater productivity, materials and energy conserving design and the great extent of automation and improved manufacturing accuracy by the use of specialized technological devices, microelectronic controls and elements of robot technology. More field of application were opened up by modifications to the equipment. Notable improvements are recorded with regard to ease of operation and lack of pollution. Among the new items in the combine's catalog is the KIASY 810/160--electronic--injection molding machine. This can be used to process all commercial thermoplastics, thermosetting plastics and rubber products suitable for injection molding. The users achieve productivity increases of up to 160 percent and materials savings of up to 5 percent.

The manufacturers of chemical plant respond to current requirements by the chemical and food industries as well as to environmental concerns. Plant and equipment for the food industry, environmental control, the extraction of technical gases and the pre-processing and processing of oil are part of the export program of the Chemical Plant Construction Combine VEB, Leipzig Grimsa.

Among the exhibits of equipment for sugar factories are centrifuges. The Kopas suspended centrifuge displayed compares favorably with discontinued centrifuges by permitting lower investment costs and manpower savings.

In addition to the exhibits shown at the Fair, the combine offers a program of lectures for 7 September. It will deal with, among others, plant and equipment for the intensive biological treatment of heavy load waste waters from coal refining, sulfur recovery according to the Claus process, the recovery of solvents and the production of biogas from liquid manure.

The GDR's chemical industry assumes a leading role at the Fall Fair and presents many new and improved products. A new item in the range of the Schwedt Petrochemical Combine VEB is Ceritol Special SEK [Registered Trademark] 7-000-9. This is a semi-liquid contact grease for lubricating electrical contacts in outdoor substations that prevents rime deposits and icing. The Bitterfeld Chemical Combine VEB offers, among others, new dyes that permit ease of washing out for the elements of the dye that are not set. The Buna Chemical Works VEB Combine, the world's major producer of carbide-acetylene, offers among others the new PVC-E types 6821 M from its Scoviny [Registered Trademark] range. Due to its fine particle size this is very important for the production of PVC pulp. The Walter Ulbricht Leuna Works VEB Combine is showing such high-quality products as Leunalin and ammonia, ultra refined for microelectronics. Leunalin has outstanding antiknock quality and is added mainly to auto fuels. This results in an enormous lowering of the lead content and pollutant emission as well as in a substantial saving of gasoline. Other top quality products are white conditioned urea from the Piesteritz Agrochemical Combine VEB, sealing compounds based on polyurethane from the Schwarzeide Synthesis Works VEB--SYS Combine--, new types of fiber from the Wilhelm Pieck Schwarza Chemical Fiber Combine VEB, "Sprelacart-flame retardant"--from the Plastic and Rubber Processing Combine VEB and the ORWO magnetic tape type 106 LH from the Photochemical Combine VEB. The latter is a stereo efficient modular recording material.

Pride of place among the items offered by the Leipzig Medical and Laboratory Equipment Combine VEB, the Telecommunication Combine VEB, the Carl Zeiss Jena VEB and the Leipzig Electric Energy Plant Combine VEB in the field of medical equipment is held by new and improved products directed to the further improvement of medical care and increased efficiency in the laboratory. The use of microelectronic components permits the achievement of greater reliability and better use values in many products. Microelectronic components, for example, raised the use value of the continuous automated analyzers offered by the Leipzig Medical and Laboratory Equipment Combine.

New and improved products of the GDR vehicle construction industry demonstrate how the combine enterprises respond to current needs--for example improvements in economical operation and traffic safety, reduction in servicing costs, greater driving comfort. To be mentioned among the extensive production range of the 5-ton IFA W 50 produced by the Ludwigsfelde IFA Truck Combine VEB is the tank truck for the movement of gasoline and diesel fuel. Worth mention among the semitrailer program of the Special Bed and Trailer IFA Combine VEB is the special bed for panel transports HLS 250.05/10. Its load safety was improved by a head strap.

The Schmalkalden Tool Combine offers tools with improved use value and design.

### Attractive GDR Consumer Goods Display

In the consumer goods industries GDR industry displays top flight assortments based upon tested models but offering many new features. Typical for the products are modern design, the greatest possible use value, the optimum volume-output ratio and deference to customer wishes.

The largest sports and recreational show in the GDR, the EXPOVITA, has been organized for the 14th time on some 12,000 square meters of exhibition area. With the slogan "pleasanter recreation with EXPOVITA" about 3,000 products are exhibited by 22 GDR combines--including some 200 new and improved products. They will be marketed by the foreign trade enterprise for toys and sporting goods export-import.

### Demonstration of Successful Cooperation by the CEMA Countries

The exhibits of the CEMA member countries again impressively confirm the steady and successful development of close cooperation within the framework of socialist economic integration. The exhibits generated by specialization and cooperation underline the statement made at the 36th CEMA Congress that socialist economic integration is turning out to be an increasingly important factor in the reinforcement of the CEMA countries status in the world economy. This fair offers many opportunities to familiarize ourselves with the CEMA countries delivery potential.

Among the collective Soviet exhibit alone 200 of the items displayed were generated in planned and coordinated cooperation with other CEMA countries in research, development and production. A special exhibit of the Moldavian SSR's Academy of Sciences introduces joint research work carried out with the GDR Academy of Sciences in the field of solid fuels. The USSR also shows MAS, VAS and Moskvich cars. Their lighting systems and spark plugs are supplied by the GDR on the basis of specialization and cooperation relations. Other spare parts and subassemblies originate in Hungary, Bulgaria and Poland.

The Soviet exhibit of printing machinery incorporates specialization agreements with GDR printing machine construction. Displayed, for example, is a large body photo-setting machine, the model FG-25P film developing plant as well as a machine for the production and printing of the control text. GDR-USSR specialization agreements provided the prerequisites for the development of efficient endoscopy equipment in both countries. The exhibit by the Leipzig Medical and Laboratory Equipment VEB demonstrates this fact by way of the improved development of a bronchoscope, a cystourethroscope, a resectoscope and a thorascopes. Among the outstanding exhibits of this combine is a series of incubators developed jointly with a Hungarian partner enterprise and now in mass production.

At the joint stand of the GDR chemical plant construction industry two integration exhibits stand out: The "central point for the collection and processing of oil, gas and water" (ZPS plant) and the original model of a machine box. Both products were developed jointly by the Leipzig-Grimma Chemical Plant Construction Combine VEB and the Soviet Giprovtorneft, Kuibyshev. They are designed for the development of new oilfields in the USSR. Compared with earlier plant they boast increased throughput while using less space, because the sections are of modular construction.

At the same time they guarantee the constant quality of the oil processing. Other examples of the deepening of cooperation on the basis of bilateral and multilateral agreements are a range of woodworking machines as well as specialized and combined milling cutters offered by the People's Republic of Bulgaria. The Romanian exhibit includes the semitrailer type Roman that can be combined with, for example, the DL 30 turntable from the GDR to yield firetrucks.

#### Socialist Countries with Efficient Goods on Offer

In addition to the GDR another 12 socialist countries, including all CEMA members, are attending the Fall Fair. They demonstrate the capacity and export power of their countries in collective and industry exhibits.

At the Fall Fair also the USSR collective exhibit will be entirely in the sign of the 60th anniversary of Soviet involvement in the Leipzig Fairs and the 60th anniversary of the USSR's establishment. More than 20 Soviet foreign trade associations and organizations are displaying 8,000 items to represent 650 USSR industrial enterprises.

Some 75 percent of the products on display are new or improved items. Outstanding exhibits are, among others, catalyzers for noble metal complexes and chemical reagents, the LRS-70 reel for long wool that incorporates the latest findings of modern textile machine construction, various types of woodworking machines and traction apparatus in the medical equipment field.

The Soviet consumer goods offer ranges from furniture by way of musical instruments, ceramics and china, domestic electric appliances, textiles and clothing, furs, radio and television sets to essential and nonessential foods. Special displays have been arranged by the Moldavian SSR's Academy of Sciences and, for the first time, by the Chechen-Ingush ASSR. This small republic in the northern Caucasus is showing, in particular, petrochemicals, models of oil extraction, oil refining and natural gas processing plant, medical devices, copying devices and traditional folk art.

The CSSR is represented by 25 foreign trade enterprises and is once again among the major exhibitors at the Fall Fair. Its stands may be found in 6 halls, in the open air and in 12 fair buildings.

The exhibition area for textile machines (hall 7) has increased by comparison with last year. Other key equipment displayed are road vehicles, printing and woodworking machines, chemicals and chemical plant, medical equipment. The CSSR is also submitting a representative display from 10 consumer goods industries. The official CSSR information booth is once again located in hall 16 on the fairgrounds.

Polish foreign trade enterprises are among the major exhibitors of chemicals, printing and textile machines. The People's Republic of Poland also has organized an information booth in hall 16. Diverse Polish consumer goods are displayed by the textile and clothing industries, the domestic and household appliance industries, the glass and ceramics and the essential and nonessential food industries. As usual Labimex is participating in Interscola.

The People's Republic of Bulgaria's technical exhibit at the Fall Fair emphasizes chemicals, road vehicles and woodworking machines. Bulgarian exhibitors have booked space for six consumer goods industries, mainly textiles and clothing, essential and nonessential foods. The Hemus foreign trade enterprise is again participating in Interscola (Fair building on the Market Place).

More than 25 foreign trade enterprises are attending the Leipzig Fall Fair from the Hungarian People's Republic. In pavilion 1114 Hungexpo of Budapest has once again organized an attractive trade center. The technical display includes textile machines, medical equipment, chemicals, chemical plant and road vehicles. Several Hungarian foreign trade enterprises are represented by negotiating agencies. The Hungarian exhibit occupies more than 10 industrial stands.

Exhibitors from the textile machinery, road vehicle and chemical industries take pride of place among the 14 foreign trade enterprises from the Socialist Republic of Romania represented at the Leipzig Fall Fair. Technoforestexport is the major foreign furniture exhibitor. Three each Romanian foreign trade enterprises present their export programs in the textile and clothing, essential and nonessential food industries. Displayed also are products of the light chemical industry, footwear manufacture and folk art.

As customary, the Mongolian People's Republic's exhibit is located in the Ring Fair building.

The core of the Socialist Federated Republic of Yugoslavia's exhibit of investment goods is the joint stand of 14 enterprises, organized by Yugoslaviapublic of Belgrade. Metalka and Autohrvatska are displaying road vehicles. Yugoslav consumer goods are featured in hall 15 (furniture) and another 12 fair buildings (miscellaneous industries). The Republic of Cuba and the Socialist People's Republic of Albania are organizing collective exhibits and information booths. Also expected in Leipzig are the Socialist Republic of Vietnam and the Korean Democratic People's Republic. They will be represented by their trade agencies in the GDR.

#### Developing Countries Use Leipzig World Trade Center

The presence of exhibitors, representatives of state organs, economic organizations and firms as well as of scientists and technicians from developing countries in Africa, Asia, Arabia and Latin America at the 1982 Leipzig Fall Fair must be considered a reflection of the rising economic potentials of the developing countries and their interest in expanding economic and trade relations especially with the CEMA countries. Egypt, for example, is displaying textile and clothing. Brazil's display is traditionally dominated by essential and nonessential foods. Among old-established exhibitors are Cacique, Inter-Continental, Amerino Portugal, Stockler and Interbras. In the Ring Fair building Port Trading and Sao Paulo Alpargatas display a generous range of textiles. India's consumer goods exhibit focuses on essential and nonessential foods as well as on textiles and clothing. Representative exhibits are offered by the firms Bhansali, Kejriwal and Hill Produce. Delhi Surgical is showing medical equipment. Iran is represented by Sherkate Saderate which displays various essential and nonessential foods. The Lebanese firm Farra has provided an information booth on the fairgrounds. Also expected are Lebanese exhibitors of essential and nonessential foods, textiles, clothing and folk arts and crafts.

The Syrian General Organization for Textile Industries is preparing to show an attractive range of textiles in the Ring Fair building.

#### Exhibits by Prominent Firms from Capitalist Countries

Leipzig's reputation as a leading center of East-West trade is affirmed by the fact that prominent firms from European and overseas capitalist industrial countries--many of them exhibitors of long standing--occupy representative stands. Multinational corporations, medium and small business enterprises from 21 capitalist countries and West Berlin will take part in the imminent 1982 Leipzig Fall Fair.

France is among the most important West European exhibitor countries. It displays exhibits from 8 investment and 7 consumer goods industries. The prominent French exhibitors include Rhone Poulenc, Citroen, Peugeot and MAM. French textile machine construction is represented by SACM. Other firms of international renown are to be met in the various Fair buildings. They include Chanel, Dior, Lanvin, Weil, L'Oréal, Interagro, Remy Martin, Hennessy, Courvoisier and Martell. Japan's main exhibits again originate with the chemical plant industry. In hall 6 we encounter such famous firms as Mitsubishi, Mitsui, Nichimen, C. Itoh, Sumitomo, Nissho-Iwai, Marubeni and Tokyo Engineering. Other Japanese exhibits are road vehicles. Here Toyo Kyogo has been joined for the first time by Nissan Motor and C. Itoh. The Japanese displays also include textile and shoe machinery, medical equipment, radio and television sets, the latter represented by Matsushita, JVC, Sanyo Electric and Sharp. Austria's exhibitors include such well-known firms as Chemie Linz, Cincinnati, VEW, Steyr-Daimler-Puch. Other industry displays will be seen among printing machines, medical and laboratory equipment, textiles and clothing, household chemicals, paints and lacquers and pharmaceuticals. The major FRG corporations, such as Bayer, Hoechst, BASF, Siemens, Bosch, Volkswagenwerk, Daimler-Benz, Thyssen and Mannesmann are represented by massive exhibits, especially from the chemical and vehicle construction industries. Many other firms show textile and shoe machinery, printing machinery and woodworking machinery. Consumer goods industries are extensively represented. Some 65 Italian firms display their export wares from 10 investment and 7 consumer goods industries. Fiat, ENI, Montedison and CTIP are exhibitors of long standing. Among the newcomers are IRMAC (textile and shoe machinery) and Pomini Farrel (plastics machinery). Well-known firms such as La Gioconda, Manifattura Augusta, Martini and Rossi, and so on, show consumer goods. Britain is particularly well represented with respect to the chemical industry. World renowned corporations such as ICI, BP, Shell and Alginat Industries have exhibits. Bonas Machine Company represents the textile machinery industry. Flow Laboratories have displayed medical equipment for many years. They have now been joined by Corning Medical and Scientific. Swedish exhibitors are displaying their goods from 7 technical and 10 consumer goods industries. The Swedish Export Council set up an information booth in hall 16.

The Swedish exhibit emphasizes medical equipment as represented by such renowned firms as Vaxjo Rostfritt AB, LKB Produkter AB, the chemical industry represented by Kema Nobel and Treilleberg AB and the paper goods, office stationery and packaging industry. Finland's exhibit centers on the joint stand of some 10 leading firms sponsored by Metex, the export association of the Finnish metal and machine construction industries. The Finnish Fair Company, once again occupying an official information booth in hall 16, is organizing a joint exhibit of the medical equipment industry, including prominent firms such as Instrumentarien Oy, Labsystems Oy and Lasertek Oy. Some 30 Finnish enterprises are offering consumer goods.

Switzerland can boast the 35th anniversary of its attendance in Leipzig. Forty-six firms are represented at the Fall Fair, among them Ciba-Geigy and Sandoz AG, the leading chemical manufacturers. Other interesting exhibits come from the "Export Association of Swiss Textile Machine Manufacturers-G. Moreau" and Grafotee AG (printing machines). The Belgian official representation is exercised by O.B.C.E. in hall 16. The emphasis of the Belgian exhibit of investment goods is on chemicals, represented by prominent firms such as Solvay, Bechimex, Essochem, Anilac and Borg-Warner. Agfa-Gevaert is displaying printing machines and medical equipment. In the consumer goods sector the Belgians are concentrating on domestic and household appliances, textiles and clothing. To be singled out is the long-standing attendance of Glaverbel in the glass and ceramics exhibit. Again in hall 16 the Netherlands Ministry for Economic Affairs is opening an official information booth. Chemicals are at the center of Dutch participation from the technical branches. Friam has taken more space to display chemical plant. Other Dutch firms show textile machines, medical equipment and road vehicles. Twelve consumer goods industries are represented. Four investment goods and 8 consumer goods industries from Denmark are displaying their wares. Represented in the sector chemical plant, subgroup plastics machinery, is once again the Haugaard group sponsored by SIO Export Trading. Also to be mentioned are the displays of medical equipment, essential and nonessential foods. U.S. exhibitors include the world-renowned chemical corporations Du Pont, Dow Chemical and Union Carbide. ICN, Ethicon and Zimmer present latest developments in the field of medical equipment. Moreover U.S. firms may be found among exhibitors in the following industries: Household chemicals, cosmetics, pharmaceuticals, essential and nonessential foods, textiles and clothing. To be noted in particular among exhibitors from West Berlin firms are Schering-Pflanzenschutz, Hanielsche Handelsgesellschaft, INTEX and WAN Warimex from the chemical industry. Other exhibitors from technical branches offer their products such as chemical plant, printing machines and medical equipment. Many West Berlin firms display their various consumer goods.

#### Sales Promotion by Information and Service

International congresses, symposiums and technical lectures are very much part of the Leipzig Fair. In conjunction with the broad international aspect, typical for Leipzig, in such sectors encouraging scientific-technological progress, they enrich the sales activities of exhibitors. In long-established cooperation between the Leipzig Fair Office and the Chamber of Technology of the GDR on the one hand, and GDR and foreign exhibitors on the other, an extensive scientific-technological program of events will be carried out at this year's Leipzig Fall Fair also. An international congress will meet on 2 and 3 September to discuss the use of rational equipment for the production of high-fashion textiles. The congress is organized by the Textima Combine VEB and the GDR Chamber of Technology. It will present to the international textile specialists experiences regarding interesting process technical innovations, the development and use of high-capacity machines and equipment in the fields of yarn making, weaving and refinement and also submit suggestions for the use of microelectronics.

Many topics will be dealt with as per the program of the roughly 80 user symposia and specialized lectures by exhibitors. This is being organized in the sectors chemicals, chemical plant, plastics machinery, textile machinery and shoe machinery, woodworking machines and tools, air conditioning, refrigeration and dust removal equipment, road vehicles, medical equipment/pharmaceuticals and technical consumer goods.

The service organization Technical Information in the new 7.11 building at the west entrance of the fairgrounds offers valuable help to domestic and foreign experts. It makes available lecture rooms, supplies information on offers and possible contacts, and arranges guided tours for foreign groups of experts. The other service organizations of the Leipzig Fair--such as the Central Service in hall 16--allow all participants to make the most of the Fair. In the Fair Information Center, located in central Leipzig, the Chamber of Technology of the GDR and foreign representatives advise exhibitors and visitors on all topics of the international fair business. The international press center ensures excellent opportunities for obtaining and processing information. The 1982 Leipzig Fall Fair will culminate in the award of gold medals and diplomas for products of the highest international standard. The awards will be made for the 40th time this year. Since 1963 more than 4,800 top rated products received this much desired distinction.

Leipzig, known as a city with a rich cultural tradition, will offer its guests a challenging cultural program at this year's Fall Fair also. The value of a visit to the Fair will be enhanced by concerts in the new Gewandhaus, the old City Hall, the St Thomas Church, the old stock exchange and the congress hall. Involved will be well-known GDR orchestras as well as artists from abroad. Other events will be literary evenings, various light hearted offerings and the International Fair Fashion Show.

#### Microelectronics from the Aspect of the 1983 Leipzig Fairs

In accordance with an old tradition, the profile of the Leipzig Fair is defined in response to the needs of international trade; current developments of science and technology are included in the Fair program so as to provide for all participants the best possible conditions for successful marketing. In agreement with GDR and foreign exhibitors the organizers of the Leipzig Fair have decided to have the 1983 Leipzig Fairs focus on the use of microelectronics.

Both fairs will center on the topic "programmed efficiency by microelectronics." The emphasis will thus be on the standards achieved in the technical sectors offering such equipment. At the same time industries not directly involved will not suffer any loss of importance. Practical and immediately usable technical solutions will be the prime criterion for buyers and other interested parties.

The scientific congress on "efficient rationalization and automation by microelectronics" will deal with general aspects and trends. It will be organized by the GDR Chamber of Technology, the organization of GDR engineers, from 14-16 March 1983 in Leipzig. Already applications from exhibitors and first reports on exhibits envisioned suggest that both 1983 Leipzig Fairs will offer a representative international cross section of the developmental standard of microelectronics.

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CSO: 2300/383

## MINISTER PUSHES FOR BETTER USE OF AGRICULTURE'S PRODUCTION CAPACITIES

Budapest PARTELET in Hungarian No 8, Aug 82 pp 23-30

[Article by Jeno Vancsa, minister of agriculture and food: "The Use of Producer Capacities in Agriculture"]

[Text] The natural endowments of our country are favorable for agricultural production. In recent years we have had yields in wheat, corn, meat and egg production exceeding anything before. In the production of certain products we have moved into the vanguard of countries; in others we have only begun to close the gap. However, with expenditures of production and the use of capacities available to us, we still have much to do.

The dynamic and uninterrupted development of agricultural production is primarily the result of the consistent agrarian policy of the MSZMP, on the basis of which we have developed a firm system of large, socialist farms. With their organizing and integrating activity, the output of small producers has also developed successfully.

With the help of industry, most of our large farms enjoy a production capacity allowing us to make good use of our favorable endowments. High-performance machinery, modern means and materials, and a high biological and genetic potential make the agrarian subbranches even more capable of higher achievements.

#### Rate of Return, Competitiveness

No matter how spectacular our results and worthy of recognition, in recent years we have not achieved all our goals. The contribution of agriculture to the national income has lagged behind our goals. The growth rate of net production is low. In certain subbranches the material expenses of production have increased more rapidly than yields. Rate of return and competitiveness have not kept pace with production growth. A one-sided, quantitative outlook still lives within us; it dates from when we were faced by one task: to see that we had enough food. Now the requirement is that we produce more food than economically and competitively on the international scene. If we compare our food production with that of the international vanguard on the basis of rate of return, efficiency and other, so-called quality indexes, our situation is not that high-ranking.

With the exception of grain, the other subbranches of crop production have developed more slowly than we wished. In particular, rough fodder production and grassland management have lagged behind our possibilities. Therefore, expenses of livestock-breeding are still too high.

The difference in results between the producer operations and district zones and the megyes has not declined but increased. The accompaniment of development is a differentiation among farms but these differences are greater than the differences in natural endowments. The causes are manifold and complex; this is why comprehensive measures have been passed to improve the management of farms producing below the national average and to reduce the differences among them.

These errors, weaknesses and failings indicate a need for more basic, more considered work both in management and producer operations. In addition, the world economy--to which we are linked by innumerable ties--requires of us greater flexibility and speed in management. The competition of food producers on markets with the ability to pay is becoming keener and keener because of the greater supply and the narrowing demand, while the price of industrial materials, energy and means necessary for producing food is increasing. We cannot delay further in a single area the frequently emphasized change in quality. We need a further strong change in management, in outlook, in conception of scientific tasks and in practical work. Therefore the fullest utilization possible of existing production capacities is extremely important.

The fulfillment of food production tasks depends first of all on producer operation. Whether we are speaking of efficiency of increased production, we can realize as much from our economic efforts as the farms do. There is a great need on the farms for increased organizing strength and increased enterprise dynamism. The new, successful forms and methods of production organization have at least as much effect on the level of management as technical progress.

It is evident from the foregoing that the human being is the major factor in further progress. We have those to rely on; hundreds of thousands of well-trained workers are available to us. Twenty-three thousand persons with university and high-school diplomas are active on our large farms. The number of those with secondary-school diplomas is more than 40,000. In 1980 there were more than 200,000 skilled workers on our farms and 320,000 semiskilled workers. They represent a huge resource; they are capable of meeting the requirements of the times and the new demands. When we speak of discovering the reserves of production capacities and of exploiting the possibilities, we base our efforts above all on people.

#### Protection of the Earth's Production Capability

We must guard and protect the basis of our agricultural production, the earth, and we must constantly guard and increase its production capability. More than 70 percent of the area of the country is agriculturally cultivated. With the general development of our country--industrialization, settlement

development and the expansion of the infrastructure--the agricultural area is declining but the rate and the kind of lands withdrawn from agricultural cultivation make a difference. The land is protected by strict laws; due to this, in the past year or so we have succeeded in sharply slowing the decline of producer land. We need to restore and recultivate areas of land formerly withdrawn from agricultural production--unused roads, ditches, and abandoned and isolated farmhouses.

There are also significant reserves in a more rational utilization of land areas. Yields can be increased by producing plant cultures most suitable to soil endowments, district zones and the microclimate. Of the agriculturally cultivated area of our country, 2.2 million hectares are acidic, 0.4 million hectares are sandy, 0.9 million hectares are alkali and 1 million hectares are regularly damaged by floods and inland waters and need to be protected or improved. Therefore, it is very important to carry out area protection work, or coordinated melioration, soil improvement and protection work on large territories. Under the Fifth Five-Year Plan we implemented such work on 450,000 hectares and the adjoining association water management with a combined investment of 7 billion forints. To continue this work we also assured the conditions in the Sixth Five-Year Plan: with 6.5 billion forints of state support, farm and interfarm melioration investments worth about 10 billion forints can be implemented. With this we can produce annually an additional 1,300 tons of grain.

We need to devote greater attention to the natural renovation capability of producer land. Annually on agricultural farms, 14 to 15 million tons of "solid" manure is produced and on small farms about 5 million tons; the volume of liquid manure amounts to 30 to 35 million cubic meters. The 14 to 15 million tons of farmyard manure corresponds to about 200,000 tons of NPK (nitrogen-phosphate-potassium) active agents. "Solid" organic manure is of great importance in managing the production capacity of the soil. Therefore, our farms should devote greater attention to its treatment and use. Only one-third of the liquid manure is used; in this way 50,000 to 60,000 tons of NPK active agents are lost. There are also great reserves in the utilization of waste manures originating outside the farm.

The rational use of chemical fertilizers is of basic importance in the management of nutritive material. By the middle of the Fifth Five-Year Plan we moved to the world's first eight countries in the utilization of chemical fertilizers. Annually, the farms use 1.4 to 1.5 million tons of chemical fertilizers with active agents and a value of 13 billion forints. This lags somewhat behind the agronomical requirement of 1.7 million tons for cultivated plants. A laboratory equipped with a 15-unit instrument pool is helping in the economical and rational use of chemical fertilizers. In addition to increasing the volume, the transportation, storage and distribution technologies for protecting quality chemical fertilizers are very important. The increasing use of microelements and fertilizers for spraying leaves may bring a further increase in the safety of production.

## Exploitation of Biological Endowments

One of the most important reserves of agricultural production is the ratio of exploitation of biological potential. By relying on plant improvement and research--also making use of the results of other countries--we must assure the dynamic development of the biological base.

The genetic capacity of arable-land crop production has increased by about 30 percent in the past 10 years. At the same time, the utilization of possibilities latent in different crops averages 50 to 60 percent. The example of the vanguard farms shows that with the sowing structure appropriate for the endowments of the site, careful crop selection and the development and strict maintenance of correct agrotechniques, results can be significantly increased.

In livestock-bearing, too, a high-level and high-value breeding basis has developed in recent years. With the provision of purposeful and economic maintenance conditions and a careful and continuously developed fodder technology we have used the production capabilities of animal types to a greater extent. An improvement in the breeding capability of breeders is of decisive importance as well as an increase in the weight and viability of the progeny. The greatest reserves in young animals and their fattening are a reduction of the ratio of waste and an improvement in fodder marketing and growth ratio. In recent years--in response to a series of measures--our fodder management has developed considerably but there are still some unexploited possibilities. This refers both to the manufacture and production of the fodders and to the manner and effectiveness of utilization. In rough fodder utilization most of our farms still do not adjust adequately to possibilities. Some of the rough fodders are grown on arable land with low yields; adequate attention is not devoted to the better utilization of grasslands. With increased yields, the rough fodders on arable land can be produced on 15 percent smaller area. On areas released in this way we can grow important plants--grain, for example.

There is also a great need for the increased utilization of byproducts. Forty percent of the products of our arable-land plants are byproducts by the energy-saving processing by which we can further increase the fodder basis of animal breeding.

Feed-grain-consuming types of animals represent a significant share of our stocks. We use as feed more than 70 percent of the country's fodder grain production. A 1 percent savings in feed grain will increase the grain-export commodity base by 6 percent. Our fodder protein import possibilities are limited; therefore--in addition to extending the protein-saving foddering technologies--it is important that we should provide the additional protein necessary for development from domestic sources. Above all, it is necessary to improve the quality of domestic industrial proteins, to process a greater ratio of slaughterhouse waste and to increase the production of protein-bearing plants and improve their processing.

## Efficiency Increase, Energy Savings

Energy utilization by our subbranches in 1981 amounted to 28,000 quadrillion calories. This is about 10 percent of the demand of the national economy. In this, the agricultural subbranch has a 56 percent share; the food industry, 43 percent; forest and wood economy, 4 percent. Last year agriculture required 6 percent of the nation's energy. Consumption increased dynamically until 1978. In response to economy measures, agriculture saved 3 percent, as compared to the previous year, in 1979, and 6 percent in 1980, while production increased. The total sum devoted to energy surpassed 10 billion in 1980, which is triple the average of the Fourth Five-Year Plan.

The most important tasks of energy management can be divided into three groups:

- general energy savings in all areas;
- the testing of new, energy-saving production and procedures, and their broad-scale extension to all subbranches; and
- the substitution of import energies with agricultural byproducts and wastes; that is, the discovery and utilization of new energy sources. Important energy sources can be found in agriculture. Several farms have begun useful experiments with straw, cornstalks and cobs for thermal energy. Our goal is that by far the greater part of product-drying should be done by the middle of the 1980's with the use of waste energy.

Several vanguard enterprises and farms are making an effort to meet all or part of their needs in 1990 on a bio-, solar and coal energy base. Science and application must help in working out a broader application. We must also as soon as possible answer how agriculture can link into the country's energy production.

All these aspects show that energy management is at least as complex a task as the protection of the land. Farm managers must treat this work as an organic part of enterprise management.

Our development and production policy efforts also determine our tasks in the investment field. With the rational utilization of material resources available to us, we can create conditions for expanded production. This is particularly true if in certain areas we do not commit our mistakes from the previous plan cycle.

In enterprise fixed-asset management, the advantage is given to reconstruction projects that expand production capacities. With modernization and the raising of the technological level, we must improve the utilization of fixed assets and management of buildings. We support investments that save energy. Let us take care to see that the investment programs of individual branches are also realized in a proper ratio.

In mechanization we strive for a complexity that serves production efficiency. From industry we expect fuel-saving, high-performance machines. The introduction of energy-saving procedures assumes a series of new equipment, not only on arable lands but also with fodder management, livestock-breeding, produce

storage, drying and processing. The elimination of waste is impossible without modern regulator and measuring means and instruments.

New soil cultivating, plant protection and soil production-capability management procedures require new means. We base machinery supplies on a domestic base as well as on socialist and capitalist imports. The narrow investment possibilities require that the farms be able to buy whatever investment truly increases their efficiency. Let us hope that domestic machine manufacture will meet such demands from our farms.

The maintenance of machines and the avoidance of farm mistakes are the task of the agricultural operations. The general overhaul of machines in winter--aside from a few special tasks--is also the responsibility of production operations. Therefore, we support the establishment of repair shops on an internal or association basis. We do this in the case of associations among farms developed for the use of special high-value and high-performance machinery or machine contract work performed on other farms. Mechanization cooperation based on mutual advantages is also developing, fortunately, with several neighboring countries. It is also important that the farms strive for mechanization most appropriate to their endowments and extending comprehensively to the full technological process, because this allows the best utilization of machine capacity.

The experiences of differentiation on large farms also point to the further dynamic development of agricultural production, a significant increase in the level of management and above all better exploitation of producer capacities. During the 5-year plan, 560 agricultural producer cooperatives--40 percent of the total--farmed at a high level. This included 60 unfavorably endowed cooperatives. These cooperatives with a high level of means provide more than one-half of wheat, corn, milk and pork production. The management and financial situation is stable, which indicates that most of them will long remain among the best cooperatives. These cooperatives will be in the coming period a force in agriculture and continue to have a very important role. With the development of cooperation based on mutual interests, they can contribute to a significant degree to the increase of production on farms that are stuck in their development or for various reasons cannot take advantage of their possibilities.

Among the agricultural cooperatives, 390--or 30 percent--are managing around the average level. In their production structure, agricultural activity is most important. They have an important role in the successful execution of the grain program and in milk and meat production. But their management is not stable, because some of them move from the well-managed to the weakly managed cooperatives from one year to the next. In this group the reserves for increasing production and efficiency are great; these can be discovered by development of a production structure better adjusted to the endowments, more flexible adaptation to economic regulators, improvement of farm and work organization and the appropriate personnel conditions. The consolidation of their management and financial situation is an important task.

About 100 cooperatives managed at a low level last year. In 90 to 100 producer cooperatives, floods and inland waters caused damage; 60 producer cooperatives also have unfavorable endowments. In 120 to 135 cooperatives, the main cause of the low-level management is the unfavorable site; in about 100 cooperatives, on the other hand, the level of leadership. The production volume of this group is equal to one year's export of agriculture. They farm an area of 1.5 million hectares, have fixed assets worth about 40 billion forints and employ 145,000 workers.

These cooperatives operating at a low level are the most important reserves for increasing agricultural production and for better exploiting production capacities. We can and must bring about a favorable change in those 100 producer cooperatives where the natural endowments are average or better. Thus, the low level of profitability is primarily due to poor utilization of means or primarily subjective causes. Therefore, it is important to improve the supply of skilled workers and to stabilize the leadership and the management at a higher level. Wanting to assist in this, we have increased the budget for skilled workers by 100 million forints. In using this money we have given preference to those who undertake as a group to develop a given producer cooperative. Of course, we guarantee that after their contract expires they may return to their previous place of work and assignment.

An increase in average yield is of basic importance in cooperatives managing at a low level. They are achieving yields 20 percent less than average in various products that are also important as agricultural exports.

The application of new organization and cooperation forms for the more effective utilization of producer capacities is purposeful. We have stimulated cooperation among the producer cooperatives primarily by payment means. In the wake of control measures, the interest of strong farms has increased in establishing cooperation to help in the development of farms with low revenues and unfavorable endowments. To this end, we need a vigorous use of the material resources and production capacities of large farms operating at a high level.

The number of cooperative projects is still low despite the fact that:

- (1) farms with low revenues do not have modern machines and means, generally because of a lack of money;

- (2) many of them do not make use of their considerable meadow and pasture areas and do not exploit their present animal quarters;

- (3) the high price for many types of production on the strong farms hinders the development of crossbreeding because they do not have sufficient production means.

The local possibilities for cooperative projects have been developed, summarizing on the basis of actual forecasts of large farms managing different levels and profitability (see column 1).

- the joint employment of skilled workers;
- the joint utilization of means;
- the area of organization and management; and
- production, including one or more agricultural activities, any combination of these and the full scope of management.

Cooperation promotes the more rational utilization of the producer base in large farms with low revenues; at the same time the farms managing at a high level can operate their means more efficiently. It would be particularly useful if the strong, large farms would modernize by reconstructing the deteriorated and obsolete animal quarters of the large farms with low revenues and improve their usability. It is important for the cooperating large farms jointly to analyze the production structure of the low-revenue farms, their financial situation, their management and organizational methods, the system of interests, and the annual and medium-term development plans. It is useful if the upper- and medium-level managers of the large farms with differing profitability work out, for individual subbranches and activities, an interest system and control method tied to the same performance.

Large farms with low revenues can transfer a part of their area for use or use it jointly. The economic regulators stimulate economic production cooperation both from the aspect of support and taxation. Large farms with unfavorable endowments receive price supplements for sales of products produced through economic association, as if they produced these independently. The entrepreneurial interest of large farms managing at a high level is also increased, in addition to supports, by the fact that they may be taxed according to the conditions of the low-revenue farms on profits gained in association. The possibility will also exist for the strong, cooperating farms to transfer their reserve base--without obligation of repayment--to weak producer cooperatives. This may be used for the development of a value increase in cattle and sheep stocks.

Support of household and auxiliary farms is an organic part of our agrarian policy. For this reason, good methods will also be extended in the organization and integration of small producers; here, too, the stronger will help the weaker. Agricultural production development cannot do without a rational division of work based on the mutual material interests of the large farms and the small producers. In addition to the unused capacities of the small producers, significant reserves in land areas are not used economically on a large-farm scale, in the lease of buildings and machinery and in the establishment of new plantations with a large farm. About 200,000 animal quarters not suitable for large-farm pig breeding can be leased to small producers and specialized coop groups. We support least fattening arrangements and the farming out of cows.

Broadening Cooperation among Farms

Under the basic conditions of cooperation by large farms and small producers are given. Moreover, there is a need for expanding relations of food, industrial and commercial enterprises. The development of agricultural production can be solved only with the effective help of industry. By using experiences gained thus far, let us take more into account in basic industry development those common interests deriving from improving the general situation of the economy. We are striving to make cooperation an organic part of cooperative political work. In this, the megye, party, state and special interest organs have a great role, because as a result of the concentrated area placement of the farms with low revenues and the strong farms it is unavoidable that cooperation should develop independently of economic borders.

Broadening the scope of cooperation is a special area for discovering reserves because it is advisable and justified to use it only where both the economic and personal conditions are given. We must regard cooperative projects as a process requiring a change in outlook and a great readiness for innovation.

I have referred a number of times to enterprise tasks, including farm and work organization in which much remains to be done. It is not enough only to urge enterprise independence; it is also necessary to have independence for production units and brigades and to take initiative. Therefore, the further development of farm democracy is an important enterprise interest. It is our experience that where the level of management is low, farm democracy is weak. The choking of the critical spirit is a serious obstacle to development.

Let us also urge more vigorously the undertaking of voluntary work in free time, particularly in the harvesting of big-value produce that can deteriorate rapidly, as well as in selecting and in assuring good quality. Production discipline also needs to be improved. The use of the worktime base and the intensity of worktime is low; the ratio of multishift work is not appropriate, particularly in the periods of campaign work. It is necessary to increase the interest of the workers and managers in improving quality and efficiency. In this area, many existing initiatives are worthy of extending. We must also help with government work in the fair material recognition of additional work.

We shall continue to devote great attention to the training and retraining of workers. We want to put the grading, the moral and material recognition of enterprises on new bases. Judgement must conform to requirements and we must evaluate and recognize this in management.

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UNITED STATES PORTRAYED PLAYING NEGATIVE ROLE IN WORLD TRADE

Budapest FIGYELO in Hungarian 5 August 82 p 3

[Article "International Commerce--Crisis and Discrimination"]

[Excerpts] Commercial wars are phenomena usually accompanying economic crises. The most important means of such wars are import restrictions, export supports, and the creation of various cartels. These means are being woven more and more into international commerce in the 1980's and restraining normal development.

The "classical" inventory of commercial war has been supplemented in the past years by a mesh of discriminatory measures taken for various political reasons. In this connection we may point to measures taken by the United States against the Soviet Union with the embargo on ordered grain deliveries; the delivery embargo used by various countries in course of the Iraq-Iran war; the embargoes imposed against Argentina during the war for the Falkland (Malvina) Islands; and the commercial and credit restriction package plan announced by the Reagan administration against socialist countries.

Historical experience shows that the use of commercial restrictions, no matter what the motive by which they are dictated, retard the development of international commerce, and deepen the difficulties of national capital in a crisis situation. It can be shown that the import-restricting measures which call for various kinds of delivery embargoes upset the system of guarantees in private law contracts. With this the risks of foreign trade are increased which have already been basically increased by the hectic changes in prices, exchange rates, interest and other factors caused by the crisis.

One of the most topical examples of political-economic discrimination is that which the United States is trying to implement to prevent the natural gas pipeline that is to be built between Siberia and Western Europe. But the West European countries and Japan are sharply opposing the dictates of the United States, which significantly violate their national interests. Even Prime Minister Thatcher, who is well known for her anti-Sovietism, refused to support it and announced that the British firms would not follow the American measures.

Regarding the commercial restriction against the Soviet Union, the member states of the EFTA announced their decision to keep their distance from the unilateral measures taken by the United States.

Representatives of the European Economic Community forthrightly condemned the intention of the United States to impede the construction of the gas pipeline between Western Siberia and Western Europe. The European Council is urging a dialogue between the European Community and the United States by the commercial-political measure.

### The Danger of the Credit Weapon

It is now a subject of debate among experts on international law whether the United States has the right or not to order a delivery embargo, for example, on European products manufactured with license contracts. The general view is that the United States can renounce the license contract because such a possibility is permitted by the contract, but it cannot force the producers to differentiate by countries, for this is not stipulated in the contract. But renunciation of the contracts--in the Western view--would cause more harm to the American firms than was caused to American farmers by the earlier unsuccessful anti-Soviet grain embargo.

Such an action would bring about a freeze in license traffic, which would be harmful not only to the capitalist countries but would also significantly retard the development of American technology. (The balance surplus in U.S. license trade is growing smaller from year to year, and American firms are buying more and more West European and Japanese licenses.)

Also included in the inventory of restrictive weapons used by the United States are measures to freeze credits and to withhold credit guarantees. With these steps the weapon policy seeks to bury the credit base which assures the normal development of international economic relations.

The ITC [Institute for International Settlements], which is the international organization for banks of issue, calls attention from time to time to the dangers that may be caused by the freezing of credits under the present conditions of a crisis of confidence. Recently the liquidity of international commerce was endangered significantly because of the various measures limiting credits which have been taken by the American government, and the credit chain threatens to break with a catastrophic effect throughout the world.

And as groups of nations, the International Federation of Bankers, the International Club of Foreign Exchange Dealers have frequently warned that in such a crisis the various credit facilities of the world may be paralyzed. It is only in this way that the development of international economic relations

the material conditions will be created for the repayment of debts outstanding. Force in this area--whether the source is some kind of political motive or economic tension-- will create great inequalities and it can retard by years the development of international credit relations, which is one of the basic sources of profit for bank activity. Despite strong pressure from the government, a significant part of American banks share the view that the way out of the present financial crisis is not by forcing insolvency but through patience expressed in compromises.

The specialized financial organizations of the UN (the International Monetary Fund and the World Bank), even if they do not declare openly their differences of view with measures of this type by the American government, exert themselves in practice on compromises and on a solution to the international financial crisis of confidence. An example of this is the assistance extended to Turkey to extricate itself from insolvency, and other similar measures.

The practice by the American government of using the credit weapon is particularly offensive to the developing countries, most of which cannot develop their economies without international credits or because of scanty domestic development sources even maintain the low income and consumption level already attained.

#### Which Way Should We Be Moving?

The official organization for the struggle against commercial restrictions is GATT; it has been striving for decades to develop the game rules of international commerce and to bring the countries of the world to observe these. Experience, however, shows that GATT does not have adequate strength to bring sanctions against or to prevent the commercial rule violations committed by the United States. Therefore, its activity has been limited primarily to recording the various restrictive programs. For example, in addition to tariffs, the GATT study lists in detail 800 means that influence commerce and their effects. It is drafting a work program to convince governments that they should not apply the cartel agreements belonging in this area because these limit the expansion of international commerce.

UNCTAD also advocates a law prohibiting commercial restrictions.

In its analytical work, OECD deals with decrees related to competition and cartels at the national level and regularly publishes information on this government policy.

The most noteworthy activity of OECD in this area was its drafting of guidelines for multinational corporations.

For the solution of problems in the field of international private-law contract, the UN has established UNCITRAL. In this connection, Dr Ivan Szasz, the Hungarian chairman of the organization, observed in an interview: "Nowadays troubles have come into the system of contractual cooperation which cannot be foreseen even with an honest commercial approach or expertise, or the emergence of which cannot be prevented."

#### Increasing Activity

It is evident from the foregoing that increased activity is being experienced to eliminate factors inhibiting the development of international economic relations. A particularly big role is being assumed in this by the international organizations, where the socialist countries, including Hungary, are advocating the creation of conditions for international commerce based on equal rights.

In this connection, T. L. Brewer, a well-known writer on international law, notes in an article: "The essential question is how the international organizations will gain validity for their decisions. Will the subject of the constraints be the government and/or firms, and will the approved rules be obligatory or do they have to be followed only voluntarily? The most likely next development will be that there will be obligatory rules for the governments, while the enterprises will subordinate themselves to government regulations."

The future, therefore, stands under the sign of working out international and national policies against activities restricting commerce. However, we can hardly count on this process of working out counter-regulations as being uninterrupted. There will be slump periods, and the matter may even disappear from the agenda from time to time. But in the end they cannot disappear and all the less because the restrictive efforts will not come to an end.

1001

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CONTINUING AID TO WEAK CO-OPS REMAINS PRIORITY TASK

Budapest NLP SZABADSAG in Hungarian 2 Sep 82 p 3

[Article by Janos Perczel, main department head of the National Council of Producer Cooperatives]

[Excerpts] Currently, returns of less than 6 forints per 100 forint outlay are realized at 400 TSZs [agricultural producer cooperatives]. Improvement of the operations at these farms is of vital interest to the entire economy. They farm on 1.5 million hectares of arable land. Their yields are equivalent in value to one year's agricultural exports. They provide work for 140,000 active wage earners and must support nearly the same number of retirees.

Improving their circumstances is difficult because, due to either unfavorable natural endowments or improper management they lag behind better cooperatives by 20 percent in regard to standard of production and by 50 percent in regard to rate of production increase.

It is no news that special subsidies are provided and essential to keep such TSZs viable. In Hungary, the economic regulators and the bulk purchasing prices for agricultural products are geared to the costs of average TSZs and therefore fail to cover the additional expenditures and generally lower yields of the poorer farms. Since the economy needs the output of the latter in order to meet export commitments, the special state supports and price supplements are not a kind of charity but justifiable measures of the regulatory system.

While it is important to aid TSZs operating under unfavorable natural conditions, it is even more urgent to remedy the situation at coops farming good land and producing less than optimal results.

To offset losses due to either unfavorable endowments or improper management, measures were adopted last year which will give the weak farms greater hope of bettering themselves. Eligibility for special government subsidies has been broadened; numerous tax breaks will stimulate pursuit of profitable auxiliary activities; government aid for specialists willing to work at weak TSZs has been increased; the profit-reducing measures introduced in mid-year will apply to weak TSZs to only a limited extent.

Our economic goals are well served by the priority attention which county party and council organs are currently devoting to the problems of the weak TSZs. All have put discussion of problems and suggested solutions high on their agenda. One traditional technique which deserves revival is assistance to weak TSZs provided by the successful. New forms assistance based on mutual benefit to the parties involved are being explored. It is not easy to find ready-made solutions to the diversity of problems. They must be dealt with on an individual basis in response to specific needs.

The task of aiding the weak TSZs is difficult and time consuming. It must be conducted on a continuing basis and not assume the character of a one-time drive.

CSO: 2500/394

## COAL, ENERGY DEVELOPMENTS OUTLINED

## Coal Reserves, Explorations

Warsaw TRYBUNA LUDU in Polish 6 May 82 pp 1, 5

[Article by M. Wodzicki: "Deeper and Deeper Coal: Surveyed Deposits Will Last 60 Years; Further Exploration in Silesia and Lublin Region; Mining below 1,000-Meter Level"]

[Text] We have become accustomed to the Polish economy being based to a large extent on hard coal. Although our deposits are among the world's largest, they are developed to a considerable extent. What will happen? Geologists are trying to answer this question by intensively prospecting for new deposits.

Maria Czerwinska of the Central Office of Geology declared, "The detected coal deposits in the Upper Silesian, Lower Silesian and Lublin basins total about 62 billion tons and occur at depths reaching 1,000 m. But the peak period of prosperity of our mines has passed. The geologic mining conditions of the development of coal deposits are becoming increasingly difficult and production cost is rising."

## Future Complicates Output

The reserves of the developed deposits assure coal extraction at the level of 200 million tons annually for about 60 years. But the supply of stoking coal, which accounts for 85 percent of total extraction, will last at most 40 to 45 years. In view of the rapid depletion of seams exceeding 1.5 m in thickness, which leads to a decline in coal production, the geological preparation of new deposits and deeper mine levels is an urgent task. Hence there is the need to continue studies of all coal basins.

Estimates indicate that, among the mines extracting stoking coal, 6 mines producing about 27 million tons of the fuel will have to be shut down during the 1990-2000 period. In the remaining 19 mines, extraction will gradually diminish by 11 million tons. Clearly the only way of prolonging the operating life of the mines lies in increasing the utilization of reserves located, among other places, under cities but this may adversely affect natural environmental and infrastructural structure. In some mines there is a chance for increasing extraction by developing deeper beds.

The coking coal situation looks better. Although reserves in deposits under development amount to 7.6 billion tons, they suffice to assure maintaining the current level of its extraction (about 40 million tons) for more than 56 years.

Deposits at considerable depths offer hope. Deposits as far down as 1,500 m contain an estimated 100 billion tons of fuel and represent a long-range reserve.

#### Reserves Are Growing But...

Janusz Swadowski of the Central Office of Geology [CUG] declared, "Intensive explorations in the last 5 years documented an additional 9.5 billion tons of coal. In the Upper Silesian Coal Basin [GZW], where emphasis has been placed on prospecting for coking coal, the detached deposits aggregate 6 billion tons, of which top-quality coal accounts for as much as 3.7 billion tons. The deposits are chiefly in the region of Bzie-Debina, Kaczyce, Budryk, Warszowice and Pawlowice. Deep mines with bottom galleries envisaged at the 1,150-m level already are being built on the Kaczyce and Budryk deposits.

"In Gokowice (Rynik Coal District [ROW]) the area of the Moszczenica Mine with its high-grade coking coal is being expanded.

"For several years deep drilling has been under way in the GZW regions adjoining the mines scheduled for further expansion (e.g., Lenin, Janina). Drilling to a depth of 2,000 m also is being performed in order to investigate coal quality and the conditions for eventual development.

"On the other hand, most of the new deposits of stoking coal have been detected in the Lublin Basin. The reserves detected in the Koleschowice 1 and 2 deposits contain 4.5 billion tons of the fuel."

#### Chance for Big-Time Coal

Since mining needs reserve deposits of stoking coal, the Gosciniec region will be explored. Geologists claim that they contain considerable reserves of that coal, occurring however under difficult conditions.

Large-scale explorations are under way in the Lublin Coal Basin [LQB]. The results show that only medium-quality gas-coking coal is there.

In view of the gradual depletion of the conventional located types of Silesian coals, it is becoming steadily necessary to explore the deposits suitable for other construction in order to maximize the increase in coal extraction at relatively minimal cost. This, however, requires broadening the scope of operations on the drilling teams. Unless this is done, the proper assessment of the energy and fuel needs of the country will not be properly met.

## Power Industry Development

Warsaw TRYBUNA LUDU in Polish 21 Jun 82 p 4

[Article by Andrzej Kozminski: "What Is Next for the Power Industry?"]

[Text] This is the 5th month since radio announcers began regularly declaring, "Tenth degree of supply." This means that there will be no power shutoffs, although this possibility cannot be precluded...

The still rare symptoms of the expected normalization of the economy include one that preconditions it to a large degree: improvement in the energy situation. This occurred last February. While the mean power balance in the evening peaks of workdays in December last year had been negative (there was a shortage of more than 1,000 MW) and remained negative in January this year (a shortage of about 530 MW), already in February a surplus of more than 660 MW was recorded. Despite a positive balance of nearly 360 MW, in March the available power of electric powerplants again decreased but that was due to the expansion of the scope of repair work in the power industry.

In April, on the other hand, the positive power balance again climbed to 570 MW, despite the expanded scope of repair and even... despite the exports of energy surpluses to the CEMA countries cooperating in the Friendship Power Grid.

### Why Was There a Shortage of Energy?

To understand fully the situation in the power industry, the difficulties that had until recently impeded economic activity must be explained.

In 1975, after balancing anticipated needs, the Council of Ministers declared in a special decree that during the 1976-1980 period the capacity of the public utility power industry should increase by 9,050 MW. The 5-year plan for that period reduced the projected increase in energy industry capacity to only 8,100 MW. Neither that plan nor, even more so, the decree of the Council of Ministers was fulfilled. The actual fulfillment fell 2,550 MW short of the planned goal, or as much as 3,500 MW short of the goal stipulated in that decree. The reasons for the shortfall include a lack of resources, both material and technical, which in that period were allocated for other, often extremely energy-intensive, investments.

The rapid development of many industries of industry, along with considerable growth of energy investments, led at times to shortages of energy-industry supplies needed to supply industry as well as to light cities. The shortage of supplies resulted in delays in repair programs, shortages in manpower, shortages of materials and spare parts, and poor-quality coal.

As a result, during the years 1976-1980, energy capacity fell from 8,900 MW. This falling figure is manifested primarily in underutilization of the available capacity generating facilities and in a need to postpone the inter-plant

operating periods and hence also a deteriorating condition of these facilities. The operating periods of boilers and turbine units were the longest not just among the CEMA countries but in Europe.

The consequences were not slow in coming. Last year the available power of electric power stations diminished by an average of 1,000 MW monthly. This coincided with an average monthly decline of 1,200 MW in capacity utilization owing to the growing manifestations of the economic crisis. Although last year the power balance was somewhat more favorable than in 1980, power supply to industrial users had to be curtailed repeatedly last October, November and December; there were even short-lasting shutoffs of residential power.

The improvements in the situation in February this year were also due to a 600-MW decline in the power demand of consumers, chiefly industry, accompanied by a 1,330-MW increase in available capacity of the energy industry.

Before the Demand Rises....

This was chiefly due to the completion of scheduled repairs of units in electric powerplants. At the same time, the decline in energy demand resulted in normalizing the operations of the energy industry, since it dispensed with the need for straining the equipment to the utmost possible limit. This also resulted in sufficient relaxation of demand, especially on Saturdays and Sundays, for conducting emergency repair, thus avoiding any major disturbances.

The investment projects finally began to bear fruits. At the end of February this year a new 200-MW turbine-boiler unit was put into operation in Polaniec, along with a prototype 360-MW unit in Belchatow, which--though not until 4 May--permanently connected to the grid, will be of great assistance to the national power grid during its operation. Also contributing were the adequate supply of electric powerplants with hard coal and the nearly on-schedule deliveries of brown coal.

One may ask to what extent have the economic reform introduced at the beginning of this year and the higher prices of electrical energy, mandatory since then, contributed to rationalizing the power consumption of the economy? The answer is not difficult. No matter how high the share of energy in production cost is, in the present seller's market every producer charges it to the buyers by correspondingly hiking prices of goods. Thus, economic stimuli for saving energy still do not function in the economy--apart, of course, from private power consumers in their own dwellings.

Implementing the Resolution of the Ninth Congress...

As the economy emerges from the crisis and as industrial production increases, energy consumption will rise again. Explicit signs of this already have appeared. In addition, owing to improvements in the mechanisms of the economic reform, labor productivity will inevitably increase.

The alleviation of shortages of imported supply materials owing to a decrease in the socialist countries will also be advantageous. It is assumed that before the end of the year the economy will revive as the demand for energy demand will increase. Thus, the power industry should be prepared and should not again hobble the growth of the economy.

The ninth Party Congress declared that the increase in the production of fuels, energy and raw materials is the most important task in surmounting the crisis. That decree also obligates the government to prepare the nation's power balance sheet and, on this basis, to draft a comprehensive long-range program for the development of the energy industry.

As early as this year, the economy's demand for electrical energy may reach 29,000 MW and until 1985 it may increase by 1,000 MW annually. By 1990 it may reach 39,000 to 40,000 MW.

In 1984 with these needs, the construction of the Polansky Electric Power Station was to be completed and the next scheduled electric power station in Opole—also hard-coal-fired and with a capacity of 2,000 MW—should be built. The construction of the pumped-storage electric powerplant in Zarnowice should be completed. An additional 11 turbine-boiler units of 100 MW should be built in Belchatow. Lastly, the first stage of the construction of the atomic powerplant in Zarnowice should be completed. It is also necessary to expand the grid of power transmission lines, whose development for years lagged behind the needs of the economy.

About 3 percent of investment outlays must be spent on energy investments until 1990. Energy investments take a long time to complete, must begin many years in advance, absorb considerable material resources and are costly. They must be preceded by a no less costly and prolonged expansion of the mining of hard and brown coal, with the latter expected within less than 10 years to become the principal fuel in the energy industry. If mining is initiated, the share of the energy industry in national investments until 1990 should amount to 13 percent.

According to experts, the postulated increase in energy-industry capacity must be achieved or economic development will be stalled or at best curtailed. Now are the energy needs of the economy to be balanced with the limitations of the power industry while reducing the scope of investments? It must be decided that developing the energy industry is necessary. The method of meeting such an effort is what is awaited first. This is a burning question. As early as this year the highest needs of the fuel-energy complex amount to 10 billion zlotys (in 1978 prices), while the central plan of investment calls for 10 billion zlotys less for this purpose.

What is the solution? An efficient development of the energy industry can be sought only on government plan in the decree of the ninth Party Congress, because of the concentration of electrical energy and fuels in the power industry. The plan must be based on economic substantiation, and the government must ensure that the plan is carried out.

## Brown Coal Strip Mines

DETROIT TRIBUNE 12/20/82 pp. 3, 7

[Unassigned article: "Brown Coal Is as Valuable as Hard Coal: Construction of New Open-Strip Mines Also Is Meeting Supply and Coproduction Problems" under the headline "Good Performance of Mine Crews in the First Half of the Year"]

[Text] (GOM INFORMATION) Like the hard-coal miners, brown-coal miners performed well during the first half of the year. The tasks for coal extraction set for the first 5 months of the year were exceeded by 3.6 percent and the tasks for stripping the overburden, 3 percent. June task is ending with favorable results.

The fact that stripping the overburden proceeds at a faster rate is of major importance, since it means that a more favorable front of operations will be provided for the winter. The reserves of newly discovered coal exceed 15 billion tons, or more than one-third of annual extraction. The crews of open-strip mines are not spared the nationwide supply and coproduction difficulties. A painful shortage is that of rubber belts, adhesives and other conveyor belts, as well as certain types of bearings imported from payments of areas [capitalist countries].

Since they have an assured steady supply of fuel, the brown-coal-fired electric powerplants are performing satisfactorily. In the last 5 months they provided the national grid with more than 10 million kwh of energy. This was more than planned.

This year brown coal extraction is scheduled to amount to about 28 million tons, or 2.5 million tons more than last year. In this subsector this had been a good year, without strikes or other work disturbances.

A substantial rise in extraction this year will be chiefly possible due to the opening of seams on the newly built open-strip mines. For example, this year extraction at Belchitov is planned to reach about 7.2 million tons and at another new open-strip mine, Lubetov near Fomin, 6.5 million tons. The construction of new open-strip mines, financed from central funds, generally follows operating schedules. But the situation with the so-called renovation investments in existing open-strip mines is not as good. To maintain extraction at these mines at the current level, part of the worn machinery must be replaced, more conveyor belts must be installed, various facilities must be repaired, etc. This year about 7 billion roubles in 1982 prices must be spent in these purposes for the Association of Brown Coal Industry and Electric Power Stations as a whole.

Unfortunately, the mines have not yet received these indispensable funds. Under the principles of economic reform, they are not capable of accumulation as substantial funds on their own. Their autonomy and possibilities for active investing are limited by, among other things, the introduction of [the] prices and enterprise financial system.

...the problem of coal reserves here, certain mines will be at an exceptionally difficult situation. On the Furze Mine, for example, capacity will decline by 100,000 tons annually toward the end of next year unless investment work is carried out on an adequate scale and projects are implemented on an adequate scale. This would mean that the generation of power by the adjoining electric powerplant would have to be curtailed.

#### Key Districts

However, considerations, including the fact that brown-coal-fired electric power stations generate energy at the lowest cost, point to basing the development of the Polish energy industry on precisely this fuel. In this connection, a detailed program for the expansion and construction of new mining and power-generating districts has been drafted.

At present the extraction of brown coal will reach 38.5 million tons and the capacity of the electric power stations will reach 4,120 MW, which means a doubling of the current capacity of the entire subsector. If dictated by the country's economic situation, a new open-strip mine, Sierpcow, will begin to be built (near Belchatow) in the next few years. The mine will have an extracting capacity of 40 million tons annually; next to it will be built an electric power station with a capacity of nearly 2,000 MW.

On the scale of the whole subsector, by 1985, coal extraction should increase to 50 million tons from the current 38 million tons; by the year 2000, it should reach nearly 120 million tons. The practicality of this program is evidenced by, among other things, the recently initiated development of domestic production of the machinery and equipment needed to mine the seams and transport the output in open-strip mines. It is expected that, in order to make us maximally independent of imports, we shall build our own medium-capacity excavators and dumping conveyors. As for excavators with capacities of more than 100,000 m<sup>3</sup> a daily, we shall produce these through a coproduction agreement with a West German company.

#### Brown Coal Production

Source: GOSPLAN PUBLICATION, in *Polish Press* 24-27 Jan 67, p. 9

(Article by W.P.: "Brown Coal is Coal That 38 Million Tons This Year, Opportunities for the Energy Industry")

[Text:] Poland is the world's and Europe's fifth largest brown coal producer. Its long-range reserves are estimated at 16 billion tons, of which detected available reserves reach 5.5 billion tons.

At 1965-66 2 years ago we extracted 40 to 50 million tons. This was followed by a decline in extraction to the level of 38.5 million tons in 1967 and 39.5 million last year. Since the beginning of this year it has become clear that we cannot solve energy problems with the aid of hard coal. We have agreed with "Western" regard to brown coal plans exist for

the production of this fuel to reach 30 million tons. This increase will be achieved by intensifying the extraction at Belchatow (open-strip mine) and increasing the output of coal from the fourth open-strip mine, Turzow, to be opened in the Konin region. The operation of that last mine is particularly important, since about 1 million tons of coal annually must be shipped from the distant Turzow to the Konin electric power stations. Owing to the gradual increase in local extraction, these shipments will be reduced this year; after 2 years they will be completely stopped. By 1985 the deposit will provide an estimated 5 million tons of the fuel. The same level will be reached by extraction at the nearby Adamow Mine. Extraction at the Turzow Mine will also gradually increase. According to recent estimates, the reserves in the region of Bogatynia can safeguard the operation of the local electric powerplant for a period beyond the year 2000.

Thanks to the initiation of large-scale investments in brown coal mines, extraction will rise rapidly. In 1985 it will have reached about 60 million tons and in 1990, as much as 80 to 85 million tons. However, this progress will hinge on the supply of adequate equipment to the mines.

The first investment project to be completed will be the mine on the Sancerow deposit. The first operations there have already begun. The next sizable deposits are located in the Lesnica region. They are not as conveniently situated as the Belchatow deposits, owing to their considerable depth, complicated water conditions and the highly industrialized state of the region. Nevertheless, these deposits can yield an estimated 28 million tons of the fuel annually. Also available for development are the deposits in the region of Gubin and Gubinka and the bridges on the Nysa Luzyczna (ensuring a possible extraction of 9 million tons of coal) as well as the deposits in Skienka, Trzcielanka and Larki, which can be utilized for the needs of the local industry and population.

Thanks to reserves of brown coal and the increase in its extraction--since the beginning of the year more than 15.6 million tons of the coal have been extracted and more than 49.6 million cu m of the overburden have been stripped, which represents an increase of more than 3 million cu m compared with a like period last year--the development of electric powerplants burning this fuel will take place. Their capacity will increase by about 6,000 MW in the next 10 years, which accounts for more than one-half of the aggregate planned increment in energy capacity. The share of brown coal in the generation of electrical energy has grown in Poland from nearly zero in the Inter-war Period to about 23 to 27 percent in recent years. By 1985 in Belchatow alone power units with a combined capacity of 4,320 MW will be put into operation. The 720-MW Zatonie electric powerplant is under construction (in the vicinity of the Turzow mine). Toward the end of the 1980's a second electric powerplant will arise near Belchatow and will burn fuel supplied by the Sancerow deposit.

All this indicates that the coming decade will belong to brown coal and the development of electric powerplants burning brown coal.

# DECREE SETS NEW ENERGY PRICES, CONSERVATION MEASURES

Bucharest ROMANIA LIBERA in Romanian 30 Jun 82 p 3

[Decree of the Council of State of the Socialist Republic of Romania Regarding the Establishment of Certain Measures for the Judicious Administration and Continuing Reduction of the Consumption of Electrical Energy, Thermal Energy, Natural Gases and Other Fuels]

[Text] For the purpose of providing the conditions necessary for the development of the national economy measures were established for extending our own base of energy raw materials and resources by increasing the extraction of coal, crude oil and gas and by accentuating the energy program. This group of measures has in view the orientation established by the 12th RCP Congress for promoting a firm policy for the rational administration and reduction of the consumption of energy resources, for the strict conservation of fuels and energy in all sectors of activity and for the improvement of the structure of industrial production.

Beginning with these orientations and tasks, lower levels were established, depending upon the types of fuels, regarding the production of thermal energy as well as the distribution of this energy to consumers.

Under the conditions of the continuation of the energy crisis on a worldwide scale and the increases in the costs for production and exploitation in all categories of fuels, it is necessary to adopt new measures designed to ensure the judicious administration of energy resources and the reduction of the consumption of fuels by increasing efficiency in their use, the elimination of losses in the transportation of energy and any form of waste, and the rigorous rationalization of the consumption of all categories of fuels, electrical energy and thermal energy.

At the same time, the requirements of the national economy, as well as the implications of the world energy crisis, require firm measures for the profitability of the production and use of all categories of fuels, which has brought about increases in the prices for the production of natural gases, crude oil, fuels and electrical and thermal energy.

As a result, it also appears to be necessary to recalculate the retail prices and charges on fuels, thermal energy and electrical energy that are delivered to the people, in order to apply the principle of profitability to this sector of activity as well.

At the same time, the new prices will ensure a more equitable relationship between the different categories of fuels and thermal energy.

Through a more judicious use of thermal energy in the people's homes, each family must achieve a reduction in the consumption of energy by approximately 20 percent. In order to cover the rest of the price increases, appropriate monetary compensation will be given so that, overall, the measures approved by the 12th RCP Congress will be fulfilled regarding increasing the standard of living of the entire population.

To this end, the Council of State of the Socialist Republic of Romania decrees:

#### Chapter I

#### Measures for the Rational Use of Electrical Energy, Thermal Energy and Fuels By Socialist Units

Article 1. - The ministries, other central organs, county and Bucharest municipal people's councils, centrals, enterprises and all state, cooperatist and public socialist units will take measures for the reduction of consumption and the rational use and conservation of combustibles, fuels and electrical energy, for the elimination of all forms of waste and for the rigorous adherence to the consumption norms established according to law.

The State Planning Committee, the Ministry of Technical-Material Supply and the Review of the Management of Fixed Assets and the National Council for Science and Technology, together with the other ministries and central organs, are required to ensure the improvement of technological processes, the modernization or replacement of installations having high levels of energy consumption, the rationalization of the fluxes in production, the proper maintenance and use of machinery, the elimination of losses in the transportation of energy, the full recovery of energy resources and the growth in the efficiency in the use of fuels, as well as the use of certain new energy sources.

Article 2. - The ministries, other central and local organs and the production and research units are required to take measures to diminish the consumption of steam and hot water, first of all among the large consumers in the economy.

To this end, in each unit there will be an analysis of the manner of administering thermal energy and the required amounts of fuels will be established in accordance with the optimal temperature norm for the steam or hot water that is delivered.

On this basis, operating conditions will be established for those units that produce thermal energy according to the requirements of the production processes so as to obtain a reduction in the consumption of fuels, especially petroleum and gases.

Article 3. - The ministries and other central organs, together with the National Council for Science and Technology will re-examine the programs regarding the promotion of certain new sources of energy and will work with

firmness for their introduction into the economy for the purpose of reducing and replacing the consumption of petroleum, gases and coal in the production of thermal energy.

Article 4. - The Ministry of Electrical Energy carries out the function as the sole administrator of all energy sources and is responsible for fulfilling the measures regarding the production, distribution and use of electrical and thermal energy under conditions of maximum efficiency.

Article 5. - For the purpose of increasing economic efficiency and reducing the cost of thermal energy, the Ministry of Electrical Energy will take measures to extend the combined production of electrical and thermal energy and to replace those heating installations with a high level of fuel consumption, as well as to move to the large-scale use of coals and other new energy resources.

At the same time, in the design of new thermal power stations we will keep in mind the possibility of them using, under conditions of efficiency, any type of fuel and of being located as close as possible to consumers.

Article 6. - The ministries, other central organs and people's councils will establish measures for limiting steam temperature and hot water temperature to the strictly necessary levels, as well as the periods of supply, eliminating useless operating periods or periods of reduced capacity in the thermal power stations by appropriately organizing the production processes.

At the same time, measures will be taken so that each thermal power station will institute optimum operating schedules, while the sections and units that receive the thermal energy will organize their production activities so as to stay within the established programs.

Article 7. - The ministries, other central organs, scientific research and technological engineering units, centrals and enterprises are obligated to ensure the redesign of installations, recipients and equipment that consume electrical and thermal energy or natural gases for heating for the purpose of reducing the consumption of energy and fuels and of increasing their use efficiency.

The Ministry of the Machine-Tool, Electrotechny and Electronics Industry will take measures for the redesign, standardization and start of production only on those household use items that have low levels of energy consumption. Household devices that have a high level of energy consumption will be removed from production.

Article 8. - The Ministry of the Machine Building Industry and the Ministry of the Machine-Tool, Electrotechny and Electronics Industry and the people's councils will take measures to produce boilers that will operate on coal or other solid fuels and that will have high efficiency in the regulating equipment as well, and to automate the thermal power stations and posts.

The Ministry of the Machine-Tool, Electrotechny and Electronics Industry will bring into production and produce control equipment in the necessary amounts for measuring the consumption of thermal energy in housing complexes.

Article 9. - Socialist units that create reuseable energy resources during the production process or that have such resources are required to cover their required amounts of thermal energy used in heating spaces and their own internal consumption, first of all by fully using these resources.

Article 10. - The industrial centrals, enterprises and other socialist units are required to take measures to use technological installations that consume thermal energy at normal capacities and to stop those that are lightly loaded, as well as to reduce to a minimum heat losses in the workshops, halls and buildings by making air-tight doors, openings, windows, glass areas and roofs and by creating buffer spaces in the production halls.

Article 11. - In the buildings of socialist state, cooperatist and public units, it is prohibited to have lights and heat on when work is not scheduled, with the exception of those spaces used for guards and services in the units and those for maintaining the operation of certain installations.

It is prohibited for worker personnel to use any personal device that consumes energy within the socialist units where they carry out their activities.

Article 12. - The temperature of the heat in industrial halls and other closed production spaces is limited to a maximum of 16°C, while in offices and other administrative spaces the maximum temperature is 18°C.

Article 13. - The workers councils will firmly work to carry out all the tasks and measures needed for the continuing reduction of the consumption of electrical energy, thermal energy and fuels.

At the same time, they will ensure the uniting of the efforts of all the workers so that they, in their functions as producers, owners of the means of production and the users of all material goods, will carry out their production tasks with the smallest amount of consumption of raw materials, fuels and energy and will actively participate in the proper administration of the material and financial resources entrusted to them by society and in increasing economic efficiency so that each socialist unit will carry out a profitable activity, will make the largest possible profits and will increase its contribution to fulfilling the provisions of the sole national plan and, on this basis, to carrying out the program established by the party for increasing the standard of living for all the people.

## Chapter II

### Prices and Charges to the Populace for Electrical and Thermal Energy and Fuels

Article 14. - All citizens have the duty to administer electrical and thermal energy and fuels with a maximum of care, eliminating any waste of them so as to achieve a savings of at least 20 percent compared to the 1981 consumption level and thus contributing to the general effort for the most rational use of the country's energy resources.

The room temperature in housing and in other rooms is limited to a maximum of 18°C.

Article 15. - The Ministry of Technical-Material Supply and the Review of the Management of Fixed Assets, together with the Committee for the Problems of the People's Councils, will establish the maximum consumption standards for fuels for heating housing and preparing household hot water, keeping in mind the scale for interior temperatures as regulated according to law, the efficiency ratings established for the heating equipment and the climatic regions where the housing is located.

The maximum consumption standards for fuels are established annually, according to the types of apartments, and are graduated on a monthly basis for the following periods:

- a) December - February;
- b) April - September;
- c) March, October - November.

The maximum consumption standards for fuels will be posted at the community services enterprises and at each tenants association.

Article 16. - The Ministry of Technical-Material Supply and the Review of the Management of Fixed Assets, the Committee for the Problems of the People's Councils and the executive committees of county and Buchares' municipal people's councils will take measures so as not to exceed the maximum consumption standards for fuels, as established by law.

It is prohibited to deliver fuels beyond the maximum consumption standards.

In cases where the maximum consumption standards are exceeded, including the reserves built up during the summer, and the standard costs are also exceeded, the additional costs will be paid by the personnel in the thermal power stations and those in the enterprises and units that use this energy, as well as by the leadership personnel in the people's councils, in a proportional manner based upon the responsibility of each as established under the law.

The Committee for the Problems of the People's Councils, together with the executive committees of the county and Bucharest municipal people's councils are required to take measures for the rational use of personnel and the reduction to a minimum of the other operating costs of the thermal power stations.

Article 17. - The people's councils and the tenants associations will ensure the operation of the thermal power plants for their block or apartments in accordance with the outside temperature and provide the maximum inside temperature as established by this decree, while strictly staying within the approved quotas for fuels.

At the same time, they will take measures to:

- a) improve the efficiency of boilers and heat exchangers by modernizing and periodically checking burners, cleaning wastes, economically managing the burning of fuels and reviewing the measurement, control and safety devices;
- b) limit use time to that which is strictly necessary and eliminate the useless consumption of hot water;
- c) seal doors and windows for the purpose of eliminating heat losses to the outside;
- d) combat any tendencies towards the waste of energy, ensuring measures to conserve heat in apartments and stay within the optimum consumption levels.

Socialist units, especially those in small-scale industry, will take measures to produce the materials needed to improve the tightness of heated spaces.

Article 18. - The Committee for the Problems of the People's Councils and the executive committee of the county and Bucharest municipal people's councils, with the support of all the tenants associations and all citizens, will take measures to create a fuel reserve, from the savings made during the warmer months of the year, to be used during the winter months.

Article 19. - The setting of prices and charges for the consumption of electrical energy, thermal energy and natural gases will be done in a differentiated manner at a rationally determined level of consumption in accordance with the number of persons in the family and the size of the home.

In cases where the rational level of consumption is exceeded, an increased price or charge will be levied.

Article 20. - Beginning on 1 July 1982, the prices and charges for electrical energy, thermal energy, natural gases and other fuels delivered to the people will be established as follows [Table on next page]:

## I. For Electrical Energy

1. For lighting and household use the following charges are established:

Apartment type (Family make up)	- kWh/year -							
	.65 lei/kwh		.75 lei/kwh		.85 lei/kwh		1.00 lei/kwh	
	urban	rural	urban	rural	urban	rural	urban	rural
	up to	up to	from- up to	from- up to	from- up to	from- up to	exceeding a level of	
One room apartment (1-2 person family)	450	300	450- 500	300- 350	500- 550	350- 400	550	400
Two room apartment (2-3 person family)	650	430	650- 700	430- 480	700- 800	480- 520	800	520
Three room apart- ment (3-4 person family)	700	500	700- 770	500- 550	770- 840	550- 600	840	600
Four room apartment (4-5 person family)	850	550	850- 950	550- 600	950- 1,035	600- 650	1,035	650
Five room apartment (5-6 person family)	900	600	900- 1,000	600- 665	1,000- 1,100	665- 730	1,100	730

2. For electric kitchen ranges a charge is set of .65 lei/kwh for a level of consumption of 120 kwh/month.

3. Electrical energy that is used for common utilities in housing complexes a rate of .70 lei/kwh is paid.

The rates outlined in the preceding paragraph are also applied to electrical energy delivered to hospitals, schools, centers and other users which, in accordance with the law, are supplied at the rate in effect for the populace.

## II. Thermal Energy

1. The charge for thermal energy produced by units subordinate to the Ministry of Electrical Energy, as well as the charge for thermal energy produced through natural gases by the units subordinate to other ministries, central organs and the county and Bucharest municipal people's councils, are set at 220 lei/Gcal.

2. The charge for thermal energy produced on the basis of liquid fuels by units subordinate to ministries other than the Ministry of Electrical Energy and central or local organs is established by the executive committee of the county and Bucharest municipal people's councils on the basis of the standard costs for 1982 and a level of profitability of up to six percent to the limit of 345 lei/Gcal.

3. The rates in effect for the populace as of 30 July 1982 for thermal energy produced on the basis of coal in the thermal power stations subordinate to the people's councils or ministries and central organs other than the Ministry of Electrical Energy remain unchanged. The delivery of coal to the power stations that produce thermal energy for the populace will be done at the delivery prices established for the stations of the Ministry of Electrical Energy.

4. The charges for the thermal energy delivered to the populace, as established according to the provisions in points 1-2, include the production prices and the quota of the legally established distribution costs, including the cost of the electrical energy used to pump and repump the thermal agent.

### III. For Natural Gases

The following prices are established:

1. For natural gases delivered for the heating of homes using stoves or by way of micro-power plants in housing buildings, as well as for the preparation of food, the following prices are set:

Type of Apartment	- cubic meters annually -			
	1,000 lei/ 1,000 cm	1,100 lei/ 1,000 cm	1,200 lei/ 1,000 cm	1,500 lei/ 1,000 cm
	up to	from - to	from - to	levels above
One room apartment (1-2 person family)	1,000	1,000-1,100	1,100-1,200	1,200
Two room apartment (2-3 person family)	1,600	1,600-1,750	1,750-2,000	2,000
Three room apartment (3-4 person family)	2,000	2,000-2,200	2,200-2,400	2,400
Four room apartment (4-5 person family)	2,350	2,350-2,550	2,550-2,800	2,800
Five room apartment (5-6 person family)	2,800	2,800-3,050	3,050-3,350	3,350

2. For natural gases delivered for the preparation of food in homes heated by the centralized heating system or by other fuels:

-cubic meters annually				
Number of family members	1,000 lei/ 1,000 cm	1,100 lei/ 1,000 cm	1,200 lei/ 1,000 cm	1,500 lei/ 1,000 cm
	up to	from - to	from - to	levels beyond
1-2 persons	200	200-220	220-240	240
3 persons	250	250-280	280-310	310
4 persons	270	270-300	300-330	330
5 persons	310	310-340	340-380	380
over 5 persons	330	330-360	360-400	400

3. For natural gases delivered to the power stations that produce thermal energy for the populace, as well as for the common utilities in the housing complexes, the price is established at 1,000 lei/1,000cm.

The price outlined in the preceding paragraph is also applied to the natural gas delivered to hospitals, schools, centers and other users which, in accordance with the law, are supplied at retail prices.

#### IV. For Liquid and Solid Fuels

The retail prices for liquid and solid fuels that are sold to the populace are those listed in the annex to this decree.

Article 21. - The difference between the discounted lower retail price or the commercial surcharge is represented by the tax on trade.

Similarly, the tax on trade covers the differences between the prices for thermal energy delivered to the populace, less the level of costs involved in the distribution and production.

Article 22. - The payment for the thermal energy needed to heat homes and prepare household hot water is normally made monthly, according to the level of consumption registered.

At the request of the tenants association, payments for the thermal energy used during winter also can be graduated over the other months of the year.

Article 23. - The ministries and other central and local organs will take measures to reevaluate the stocks of liquid and solid fuels, as well as the liquified petroleum gases existing in stocks at subordinate units, as of 30 June 1982.

The reevaluation of the stocks, as well as regulating differences, will be done according to the standards of the Ministry of Finance.

## Chapter III

Article 24. - For the purpose of compensating for the increases in prices and charges for fuels, thermal energy and natural gases outlined in this decree, the funds set aside for workers and retired persons are set for an entire year in the amount of 3,436 million lei. These funds are added to those listed in Decree No 283/1979, in the amount of 2,504 million lei, so that for one year the total amount of funds to compensate for price and rate increases on fuels, energy and natural gas totals 5,940 million lei.

Article 25. - Compensations for the price and rate increases established by this decree and those outlined in Decree No 283/1979 are given to all categories of workers and foremen, regardless of their salary levels, as well as other categories of workers who have salaries of up to 4,000 lei per month, differentiated according to the number of children in their care and within the framework of certain sums that are annually calculated as follows:

- for those persons without children: 500 lei;
- for those with one child: 650 lei;
- for those with two or three children: 900 lei;
- for those with four or five children: 1,250 lei;
- for those with six or more children: 1,400 lei.

The compensations that are given to the workers in the sum of the 2,180 million lei established in Decree No 283/1979, plus those outlined in this decree in the sum of 2,866 million lei, represent 5,046 million lei at the single year level, and are provided from the workers' production achievement fund, the workers' profit-sharing fund, profit-sharing or from the annual bonus fund.

The compensations for the price and rate increases are paid out quarterly, in a graduated manner as follows:

	In Quarters I and IV lei/quarter	In Quarters II and III lei/quarter
- for those without children	150	100
- one child	200	125
- two or three children	300	150
- four or five children	425	200
- six or more children	450	250

The granting of sums representing compensation for the price and rate increases will be done according to the provisions of annex No 3 in Decree No 153/1980.

Article 26. For retired persons in the system of state social security, military retirees and invalids, orphans and war widows, whose pensions do not exceed 2,500 lei per month, as well as for those benefitting from social aid, the compensations for the price and rate increases are established at

480 lei annually and are granted on a monthly basis in accordance with this decree and Decree No 283/1979. In the case of survivor pensions, the amount of 480 lei per year is granted according to the pension originally given out, regardless of the number of heirs.

The amount involved in the compensation for the price and rate increases in this decree is 570 million lei, plus the sum of 324 million lei as established in Decree No 283/1979 so that for a single year the total sum for retired persons is 894 million lei.

Article 27. - The compensations listed in Articles 25 and 26 are reduced by 20 percent for those persons who use stoves to provide heating.

#### Chapter IV

##### Final Provisions

Article 28. - The Council of Ministers will analyse and monthly report on the manner of carrying out the measures established for the rational use and further reduction in the consumption of electrical and thermal energy and fuels.

Article 29. - The people's councils, together with the workers councils in the centrals and enterprises and the tenants associations, with the help of their representatives, will ensure a broad discussion among the ranks of the citizens so they can understand, implement and spread the most efficient means for the judicious administration of thermal and electrical energy and fuels.

Article 30. - The ministries, other central organs and the county and Bucharest municipal people's councils will present proposals, by 31 July 1982, to the State Planning Committee and the Ministry of Finance regarding the modification of the economic and financial indicators in the sole national plan and the state budget for 1982, and for the third and fourth quarters of this year as a result of the influence of the prices and charges and the compensations approved in this decree.

Within 15 days from time of presentation of proposals to the organs listed in the preceding paragraph, the State Planning Committee and the Ministry of Finance will submit proposals, for approval, to modify the indicators in the sole national plan and the state budget for 1982 and for the third and fourth quarters.

Article 31. - This decree takes effect beginning on 1 July 1982. At the same time the following are abrogated from Council of State Decree No 283/1979, republished in BULETINUL OFICIAL No 30 of 8 April 1980: the title of Chapter I and articles 2, 5, 7 and 10 in this chapter; Chapter II, articles 11-13; the title of Chapter III and articles 14-16, 19-22 and 25, as well as any other contrary provisions.

Council of State Decree No 283/1979 will be republished in BULETINUL OFICIAL, with a new numbering of the articles.

# Annex

## Retail Prices for Liquid and Solid Fuels That are Sold to the Population

### I. Liquid Fuels

For liquid fuels the following prices are established:

Product	Technical Characteristics	Retail Price
1. Fuel P	STAS 177-77 relative density at 20°C a maximum of .830; minimum caloric value 10,000 Kcal/kg Means of delivery: pickup depot or PECO stations	3,200 lei/1,000 liters 3,860 lei/ton
2. Fuel M	STAS 177-77 relative density at 20°C a maximum of .870; minimum caloric value 9,900 Kcal/kg Means of delivery: pickup depot or PECO stations	2,800 lei/1,000 liters
3. Light liquid fuel for a type-3 heater	STAS-54-80 relative density at 20°C a maximum of .935; minimum caloric value 9,650 Kcal/kg Means of delivery: pickup depot or PECO stations	2,150 lei/ton
4. Liquified petroleum gas in bottles - net content 12.5 kg	STAS 66-78	
a) in bottles delivered to loco depots or fixed centers in municipalities and cities		35 lei/bottle
b) in bottles delivered to several points in municipalities and cities		39 lei/bottle
c) in bottles delivered to the buyer's home (installed and checked)		41 lei/bottle

For liquified petroleum gases in bottles of other capacities, the prices are established by the Ministry of the Chemical Industry with the approval of the State Committee for Prices by correlating them with the price for a 12.5 kg bottle.

# 10. Solid Fuels

For solid fuels delivered to the populace, the following prices are established:

Product	Technical Characteristics	Amount	Retail Price in lei
1. Coal			
- lignite	STAS No 8760-70 Minimum granules 30mm; Minimum caloric value 1,700 Kcal/kg	ton	375
- washed bituminous coal	STAS No 299-75	ton	850
- sorted bituminous coal	STAS No 298-55	ton	850
- coal brichettes	STAS No 8729-74 Minimum caloric value 4,300 Kcal/kg Levels of commercial rebates: lignite 24 percent; Washed and sorted bituminous coal 10.6 percent; Coal brichettes 9.7 percent Means of delivery: truck pickup at the loading station	ton	930
2. Firewood			
- hardwoods	Cut and stacked in piles Category A and B STAS 2340-80	ton	580
- Scrap sides	Resulting from the length-wise cutting of wood Category C STAS 2340-80	ton	580
- Difficult to chop scrap wood	Category D STAS 2340-80	ton	430
- branches tied into bundles for burning	Category E STAS 2340-80  Means of delivery: pickup "Fuel" depot, loaded into vehicles	ton	500
3. Waste wood			
- hardwood waste with a maximum of 20 percent softwood mix		ton	400

[Table continued on next page]

- softwood waste with a maximum of 20 percent hardwood mix	ton	220
- waste resulting from the processing of wood- fiber boards, panels and veneers	ton	120
Means of delivery: pickup "Fuel" depot, loaded into vehicles		
Commercial reductions:		
- firewood		160 lei/ton
- scraps, branches and hard and soft wastes		100 lei/ton
- waste from the pro- cessing of wood-fiber, panels and veneers		50 lei/ton

For other categories of firewood and wood waste used for fuel, the retail prices are established by the Ministry of Forestry Economy and Construction Materials, with the approval of the State Committee for Prices, by correlating them with the prices approved in this decree.

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CSO: 2700

## DEVELOPMENT PLANS FOR ELECTRIC POWER INDUSTRY

## Investment Considerations

Bucharest ERA SOCIALISTA in Romanian No 9, 5 May 82 pp 21-23

[Article by Gheorghe Cocos, deputy minister of electric power]

[Text] The present development of the national electric power system, which is one of the basic problems of successful construction of the fully developed socialist society in Romania, is based upon the provisions of the Directive-Program approved by the 12th RCP Congress. In the light of the requirements for the Romanian national economy's progress and the effects of the worldwide energy crisis, this program assigns tasks to increase energy resources, expand and improve the national electric power system, and further reduce energy consumption in all activities so that Romania will become independent in regard to energy by the close of the present decade. As we know, on the basis of the stage reached by Romania's power system and upon analysis of the fulfillment of the Directives of the 12th RCP Congress, the recent plenum of the RCP Central Committee discussed and unanimously approved new and important measures specified in a special decision on more intensive development of the national power base in the current five-year plan and thereafter up to the end of this decade. The plenum expressed a high opinion of Nicolae Ceausescu's contribution to substantiation of the power policy and the program to implement it, believing that the objectives, judgments and tasks outlined by the party secretary general fully serve the aims of Romanian socialist society. Generally speaking, the main objectives and courses of action for developing the national power system are as follows:

- a. Intensified harnessing of Romania's hydropower resources;
- b. Accelerated construction rates for the new thermoelectric capacities based on coals and bituminous shales, increasing their proportion in the structure of the electric power and capacity reserves, in meeting the thermal energy requirements, and in reducing the inputs of hydrocarbons;
- c. Expanded district heating, that is combined production of heat and electric power;

- d. Implementation of the program for heat and nuclear-electric power plants;
- e. More extensive use of new and renewable energy sources;
- f. Greater operating safety of all installations in the national electric power system;
- g. Reduction of specific fuel consumption and of internal technological consumption in production, transportation and distribution of electric power and heat;
- h. Most efficient possible use of heat and electric power by all consumers without exception.

In this brief presentation we note first an extensive transition from primary consumption of hydrocarbons as in the past to a balanced and varied structure of the primary energy bearers we have, accompanied by a broad campaign for energy conservation, which is actually the most important source of energy we have and one toward which the efforts in all fields of activity should be directed intensively.

The main parameters of the evolution of electric power consumption, as well as those characterizing the structure of electric power capacities and production, have made evident progress in recent years in both energy conservation and the most rational use of the primary energy bearers Romania has. In the last 5 years the so-called "elasticity coefficient" (the ratio between the growth of energy consumption and the growth of the gross national income in the same period of time), which showed values above one until 1973, has declined much more sharply in Romania than in the developed capitalist countries, dropping to about 0.8 in 1980 compared with about 0.85-0.95 in the latter. The declining evolution of electric power consumption per unit of national income reflects a more effective use of electricity in the national economy.

In the same connection, the "charge curves" and their characteristic parameters are evolving favorably throughout the system. Analysis of these curves brings out the following main findings and trends: (a) The daily charge curves have shown a steady leveling trend, with less difference between the capacity used in the summer and winter periods along with the drop in the growth rate of electric power consumption. (b) Leveling of the daily curves is more pronounced in the summer period due to introduction of the summer hour and intensified irrigation of the agricultural lands at night. (c) The heaviest stress on the capacity is in November and December.

Improvements have been made annually in the structure of the primary energy consumed to produce electric power, in pursuance of the policy to make rational use of domestic energy resources. They are graphically illustrated by the changes made in the proportions of the various primary resources in the energy reserve: In 1980 the contribution of the hydropower resources went up to about 19 percent from about 6 percent in 1965, the proportion of coals increased to about 31 percent from about 22 percent in 1965, and that of hydrocarbons dropped to about 47 percent from about 71 percent in 1965. About 3 million tons of conventional fuel were saved in 1980 by combined production of heat and electric power

As we see, the overall results are good. But there are a number of shortcomings and a number of situations that we cannot accept, such as the unsatisfactory level of electric power production based on coals, the still high specific consumption of fuel and electric power, especially in industry, the waste of power we find at a number of points, and the failure of some consumers to conform to the allocated power allotments. The Plenum of the RCP Central Committee examined these shortcomings and established measures for accurate implementation of the national energy program.

The main purpose of the program for Romania's energy development in this decade is to achieve national energy independence. Essentially this means development based on Romania's own resources, know-how and capacity. In other words we are trying both to exploit the entire potential of traditional resources in the most diversified way we can and to conserve energy in all activities and achieve a balanced, efficient structure of primary energy bearers.

In accordance with the provisions, there will be major structural changes in the electric power output and in the installed capacities. They are summarized in the following table:

	(in %)		
	Years		
	1982	1985	1990
I. Total electric power output:	100	100	100
- In hydroelectric power plants	17.4	21.2	24.0
- In plants burning coal and bituminous shales	32.4	47.5	44.0
- In plants burning hydrocarbons	42.9	24.3	4.6
- In nuclear-electric power plants	—	—	22.7
- In plants based on new and reusable energy resources	2.1	2.2	4.7
II. Total installed capacities:			
- In hydroelectric power plants	22.4	25.9	29.0
- In plants burning coal and bituminous shales	42.1	47.1	38.7
- In nuclear-electric power plants	—	—	13.3

As we shall see, analysis of the aims and tasks in the program reveal many far-reaching and varied problems to be solved by all of us who work in power engineering and also by those who are helping to carry out the program, such as builders, suppliers of equipment and materials, financing banks etc.

For an overview of the considerable efforts to be made in the field of hydro-power constructions, for example, we note that the volumes of operations specified in this field are up considerably from the previous periods: by about 300 percent in the current five-year plan from the last one and by about 500 percent in the next five-year plan from the same period of comparison. But these percentages still do not indicate very much. In absolute figures, we find that about 270 million cubic meters of earthworks, 15 million cubic meters of concrete, and 440 km of tunnels will be constructed in this five-year plan.

Much more investment capital has been allocated to develop the national electric power system in this five-year plan than in the last one, their share in the total industrial investments having been raised from 11.4 to 11.8 percent. In an absolute sum, the investments in the heat and electric power sector have been practically doubled. Of course such an extensive investment program requires a special mobilization of all units involved in this activity, such as construction-installation, design, beneficiary, research and other units.

Qualitative improvement of all aspects of investment activity is of first importance. We are and should be increasingly concerned with finding simpler construction procedures that will conserve materials and increase labor productivity in construction and installation. The same consideration applies to expanded mechanization and industrialization of construction-installation operations, introduction of new and modern construction technologies, and reduced consumption of metal, cement and other energy-intensive materials. And finally, but not in last place, we are making every effort to carry out the measures assigned recently by the Political Executive Committee of the RCU Central Committee for better management of the land reserve, in the sense of taking up the absolutely indispensable minimum of land area with the new power capacities.

The main increases in financial, material and manpower resources are being made in the hydropower field in particular. This is to be explained partly by the special emphasis on harnessing the hydropower potential and partly by the rising cost of hydropower installations as exploitation of Romania's potential progresses. The average investment in hydroelectric power plants increased from about 14,000 lei per installed kilowatt in 1976-1980 to about 21,000 lei in 1981-1985 and will reach about 30,000 lei in 1986-1990. This increase is due to some extent to the rising prices of construction materials, equipment etc., but in most cases it is because increasingly expensive installations are constructed now and will be in the next few years especially, while in the past the cheapest part of the hydropower potential was the first to be harnessed. Specific investments in the heat and electric power field are also being substantially increased because of the updated prices and the start of construction of the new power plants burning inferior coals and bituminous shales alone. Accordingly in the current five-year plan the investment has increased from about 9,000 lei per kilowatt installed in power plants burning hydrocarbons to about 22,500 lei per kilowatt installed in plants burning coals and bituminous shales.

Note however that in spite of this increase in specific investments both in hydroelectric power plants and in thermoelectric power plants, their construction is economically justified in comparison with installation of power capacities in power plants burning hydrocarbons.

Construction of a great many new power capacities is far from easy. On the contrary, the capacity to perform construction as well as installation operations should be considerably increased. Meanwhile we must take more definite measures to complete some actions in the program drafted jointly with the Ministry of the Machine Building Industry upon which attainment of the new capacities' planned indicators directly depends. We are specially emphasizing immediate extension of the technical improvements tested at the Rovinari and Turcent power plants to all the power units in those two plants and those at Anina, as well as their adaptation to the coal-based power units being installed in the district

heat and electric power plants. The new coal-based units need more prompt approval, especially the boiler generating 420 tons of steam per hour, which is the basic unit of the district heating plants that will be built in this decade, just as the improvements now in process of approval for all other installations in various stages of construction must be expedited.

Improving the designs of the thermomechanical, electrical and automation installations in the thermoelectric power plants for purposes of simplifying them and enhancing their operating reliability is a problem of great technical-economic importance, as well as better organized management of coal in those power plants. Of course the greater operating reliability of the thermoelectric power plants burning coal depends heavily upon improvement of the equipment installed in them and of the materials used to construct it. It is a much discussed problem that has been and is the subject of special programs. Although some good results have been obtained, much remains to be done in designing the equipment and especially in designing it for construction in all plants supplying power equipment.

The fact is of vital importance that the Romanian machine building industry has assimilated manufacture of nearly all the equipment needed to outfit the thermoelectric power plants and the hydropower and other power installations, and the fact that many improvements have been made in the domestically manufactured equipment in recent years is equally important. We refer to the 50 megawatt sets, which perform well in operation, various electrical devices, and the 330 megawatt sets, in which many improvements have been made. But in this connection we must realize that the growing demands upon the efficiency of the power system, and by that we mean primarily the increase in coal-based electric power production, require considerably increased efforts to improve the power equipment. We often encounter equipment that was carelessly manufactured in the factories, like Redler strips on lignite-based boilers generating 420 tons of steam per hour, the coal grinders, the machines for handling coal in storage, etc. It costs the national economy much more to remedy these defects at worksites than it does to provide for their careful manufacture in the factories. The greatest losses come from unreliable performance of the equipment, low power output, higher specific inputs and costs, and impaired economic effectiveness. Note that the poor quality of such equipment is due not so much to its design as to unsatisfactory manufacture in the machine building factories.

In this connection it should also be pointed out that some equipment suppliers remedy defects or make improvements in certain equipment at worksites and then do not take those measures in manufacturing similar equipment for other capacities, so that we encounter the same difficulties in several cases. We cannot accomplish our difficult tasks in implementing the energy program in this five-year plan and in the period up to 1990 unless we receive such more support in this respect from the machine building industry.

Substantial improvement of construction-installation operations first requires growth and improvement of the labor force through long-term programs including recruitment, schooling and qualification of the various categories of personnel. The effort to stabilize the labor force must be considerably increased, especially at the more isolated hydropower worksites.

It is well known that our sector suffers from a shortage of skilled labor at both the hydropower and heat and electric power capacities. We would need about 5,000 more skilled workers to accomplish our tasks for this year. Of course it is primarily our ministry's task to increase the numbers of workers not only this year but also in the coming year and we have taken and will continue to take the most effective measures to do so, but we would like more help from the county people's councils in their units' provision for housing accommodations, even at the isolated worksites. We cannot scatter our forces to perform those operations too, which should be performed by other organs and organizations in the economy. Our forces should be concentrated on the basic power projects. Massive growth of labor productivity, every worker's more intensive participation in the production process, and strengthened labor discipline are inseparable from improved management, organization and control of worksite operations, improved technical-material supply of the worksites, more intensive industrialization of the operations, and supply of the construction-installation units with the equipment needed for more intensive mechanization of their operations, including tools, machine tools and devices for small-scale mechanization.

The Ministry of Industrial Constructions' takeover of the task of building some new thermoelectric power plants as well as some of the hydropower installations is a welcome measure providing for much greater capacities for performing power operations. We are counting very heavily on this aid, which we wish to be maintained and even further increased in the period up to 1990.

The construction time for the power capacities is still long in both the heat and electric power field and in that of hydropower installations. The situation is aggravated by the shortage of skilled manpower, the still limited industrialization of construction-installation operations, difficulties in regular supply of the technical-material resources, insufficiently standardised operations, etc. We must take steps to expedite construction of the power plants, since the economic effects of the delay are particularly acute from the standpoint of reducing immobilisations of funds and increasing the electric power output.

In connection with the lengthy construction periods, we are also concerned with the problem of operations that remain to be performed after some capacities are activated. This is more acute in the case of hydropower installations on inland rivers, especially those with high falls, where operations still remain to be performed after they are activated, particularly on the secondary catchments and on the respective dams as well in some cases, in order to bring them up to the planned quota. In most cases the secondary catchments have a large share of the installed discharge of the respective installations, so that it is not difficult to understand that the longer it takes to activate these catchments the longer the use of these installations to full capacity is delayed. We are also encountering great difficulties in recruiting the labor force for this kind of operations, which are performed underground. The acute shortage of miners has not only held up the rates of performance of the underground operations but in some cases it has even lowered the cutting rates in the galleries below those previously attained.

The much greater volumes of subterranean galleries to be dug according to the hydropower program for this five-year plan and on up to 1990 require a number of special, highly productive devices. Without special equipment we shall be unable to cope with the greatly increased volumes of other kinds of operations as

well. For instance, in order to make the slopes of the hydraulic channels it is necessary to assimilate manufacture of special installations for covering slopes with concrete, and high capacity (30-150 freight tons) mobile cranes have to be assimilated in order to expand the use of large prefabricates in heat and electric power projects. Special programs to assimilate and deliver that equipment were drafted jointly with the Ministry of the Machine Building Industry. But we are appealing to the machine builders to expedite the stages of manufacture of these items so that we can benefit by them at the worksites as soon as possible.

In general it is out of the question to improve or expedite the construction-installation operations in the case of electric power plants without more cooperation from the units producing power equipment and materials. We call upon those units to greatly improve delivery of the equipment by correlating deliveries with the technological order of installation, to improve the quality of the equipment, to provide the documentation needed for installation, to intensify preassembly of equipment in the factories, to lend technical aid in installation, and to take steps to promptly remedy any defects that are found in the equipment in the course of installation or in the production tests.

The program to develop the national electric power system requires better organization of the activity of the units benefiting by investments. The investment sections in the beneficiary enterprises must be staffed with qualified personnel so that they can best fulfill their obligations for the efficiency of the operations.

A greater effort and a consequently greater contribution are also expected of scientific research, technological development and promotion of technical progress in such fields as rationalization of the plans for complete harnessing of watercourses for hydropower; manufacture of standardized series of technological equipment and devices for automation, measurement and control; development of economical methods of converting the thermoelectric power plants burning hydrocarbons to solid fuels; adoption of more economical designs in the field of thermoelectric power plants burning coals; expansion of good, previously tested procedures to all power plants burning coals; improvement of the equipment and materials used in building the new power plants, etc. In all these areas a number of projects have been started but their completion is overdue, especially as regards standardization of technological equipment, determination of methods of manufacturing it, and rationalization of designs of thermoelectric power plants.

The provisions of the program to develop power engineering in this decade are very challenging. Naturally such a program is not easy to accomplish, and therefore all workers in this important sector as well as all units in the other economic sectors that are to contribute to the development of the nation's power engineering must be fully and effectively committed to its implementation. In that way we shall achieve on time the great patriotic goal of Romania's independence in the energy field.

## Production Technology

Bucharest *ERA SOCIALISTA* in Romania No 10, 20 May 82 pp 24-26

[Article by Eng Gheorghe Saftoiu, director of Energo-reparatii Enterprise]

**[Text]** As the supplier of electric power, the power sector is one of the motive factors of vital importance to Romania's socioeconomic development, and no one can be indifferent to the way this sector's product is produced or consumed or actually finalised, which product we find directly or indirectly involved in our whole environment. Awareness of the fact that the primary energy resources are limited compels the best and most rational performance of the work of all sectors contributing to the production, distribution and consumption of electric power.

The installed capacity of about 17,000 megawatts that we have should have kept the consumers supplied and created no problem. But in 1981 the increase of 3.4 billion kilowatt hours was greater than that of the commodity output, indicating that much more power is being consumed to make some energy-intensive products. As specified in the Decision of the Plenum of the RCP Central Committee on Implementation of the Power Production Program in the 1981-1985 Period and Development of the National Power Base up to 1990, 74.1 billion kilowatt hours will be produced in 1982, with an increase of 4 billion kilowatt hours from 1981. This increase of more than 5 percent is to completely cover the planned commodity output with even a certain reserve.

The structure of the power industry according to primary energy sources is particularly important. We have 3,800 megawatts installed in hydroelectric power plants and 7,200 megawatts in coal-based power plants, so that the electric power requirement can be completely covered by their normal operation. Yet hydrocarbons were the main source of electric power in 1981, they continue to be in the main proportion in 1982, and the amount of power obtained from coal will not exceed that produced with hydrocarbons until 1983. Therefore it must be pointed out that some difficulties encountered in electric power supply were not due to inadequate development of the capacities in power plants or the state of the distribution networks but chiefly to the fact that the planned coal output was not produced, so that the raw material for the coal-based power plants was not provided and a large quantity of electric power was still obtained from hydrocarbons which, as we know, are now in short supply.

The energy program for the 1981-1985 period increases the proportion of coal-based electric power production to 47 percent in 1985, which means an annual output of 87 million tons of coal. Therefore the coal industry is faced with vitally important tasks to regularly supply the operating depots at thermoelectric power plants with enough fuel of suitable quality. As one of the main features of the program, the provision that about half of the electric power output shall be produced in thermoelectric power plants burning coals and bituminous shales in 1985 is to be observed in the machine building field as well. The Ministry of the Machine Building Industry has stipulated that the proportion of mining and power equipment shall exceed 25 percent of all new products assembled in 1982.

## New Technologies and Procedures

Thanks to the regular development of the national power system, the unit capacity of the power generating sets has steadily increased along with the complexity of the technological production process and its technological effectiveness in operation. The great technical complexity of the installations with advanced automation systems, requiring electronic components and electric, hydraulic and pneumatic drives and operating under some of the highest temperatures and pressures, is indeed significant for the power industry today. All these factors considerably increase the importance of good operating safety, requiring particular care and close attention to the design, manufacture and tests of the equipment, its servicing by highly skilled personnel, and observance of the standards for operation, inspections, maintenance and repairs.

In the spirit of the party policy on reduced consumption of hydrocarbons, an installed capacity of 10,000 megawatts is specified for power plants burning coal and shales in 1985, and one of about 9,000 megawatts for hydroelectric power plants in 1990. In 1982 generating sets with capacities over 1,300 megawatts are to be placed in operation in coal-based thermolectric power plants and 400 megawatt ones in hydroelectric power plants, and efforts are now concentrated on building those investment capacities. Thus the entire capacity is intended to be installed in power plants operating on coal, secondary energy resources and water power. Along with construction of high-capacity hydroelectric power plants, over 500 small hydroelectric power plants will be constructed to exploit the potential of small watercourses and spillways.

Special efforts are to be made to construct the nuclear-electric power plants, since the tasks assigned for the purpose by the party administration exceed the original provisions of the long-range program. Activation of the Cernavoda Power Plant will be advanced, and its capacity will be supplemented with one generating set. Start of operations on the nuclear-electric power plants in Moldavia and Transylvania will be expedited.

This broad power program calls for extensive design efforts to modernize the existing equipment and also to manufacture the equipment that will be in the inventories of the capacities to be activated. It is intended to produce practically all the new units in Romania. Under the circumstances a more active role is required of scientific research, as well as a definite commitment to find and develop new technologies and new possibilities for reducing consumption and to look for new ways of reusing the materials and improving the products.

While omitting some details of strictly specialized significance, it should be pointed out that the advantages plead categorically for greater durability of the products, and design, research and planning have a fundamental part to play in that respect. Correlation of objectives and regular collaboration of specialists at all stages of research, planning and production are essential. To this end the research institutes (especially those that have not developed small-scale production or lack the necessary material resources) should collaborate directly with the units that will make the product in all stages of research, planning and manufacture. That is the only way the most useful and effective measures will be found, as well as the most economical and efficient methods in view of the technical conditions and available materials.

In discussing the technological design of the power units, we are thinking of the series of problems in connection with the inventory of units producing electric power with which the national power system is now equipped, and particularly the great equipment effort to be made in the current five-year plan. The design efforts accordingly take two main directions of investigation and application of solutions:

a. Conservation and improvement of existing equipment: It must be said that we have a very heterogeneous inventory of generating sets. Largely imported, these have various unit capacities and are based on varied construction procedures, having been manufactured by different firms at long intervals of time. As a result they show various degrees of wear and tear, thus opening a broad and equally heterogeneous field to the particular maintenance procedures, especially modernizations, elimination of bottlenecks, maintenance and improvement of performances, etc.

b. Design and production of new units in keeping with the most advanced technologies. Here it is essential to construct power plants that will meet the requirements of power production based on inferior fuels, with minimum specific consumption of materials in construction or of primary energy in operation. The new power units must benefit by absolutely all the good results of past experience, and the shortcomings indicated in the operation of the existing inventories must be eliminated.

What are the priority problems in connection with adapting a design that will ensure the quality of the power units in every respect, not the least of which is their durability, the guarantee of their prolonged use with maintenance of their technical-operational parameters?

In the first place, the improvements must be expedited that are necessary to obtain a greater reliability of the whole series of units that make up a power assembly.

In the second place, it is necessary to end the practice that still persists of using unsubstantiated or unsuitable technical procedures to the neglect of preparation and strict observance of testing programs with reliability and endurance tests. For example, a formula for material resistant to abrasion that has shown very good results on the testing stand was well studied and developed in order to prolong the service lifetimes of parts particularly subject to wear and tear, like hammers of the coal mills for the 330 megawatt generating sets. With no continuous, efficient minimal program for on-the-spot checking, they went directly into production. Under the actual operating conditions the coal contained foreign bodies and the parts in question did not produce results, so that their production had to be stopped. To return here to the rule of design, we emphasize the vital importance of operating with the most efficient technologies in order to produce parts of the best quality in every respect.

In the third place, it is urgently necessary for the technical-economic documentation to include all specifications for maintenance, repairs, supply of spare parts, and reconditioning and reuse of the parts or materials incorporated in the power equipment. It might be argued that there is no need of documentation for reuse of the parts in the case of power units, meaning the turbine and the

boiler, which generally have very long lifetimes in service. That would be a serious mistake because the power assembly is an impressive complex composed of hundreds of auxiliary installations (pumps, fans, electric filters, coal mills, compressors etc.) with different production flows (the coal control alone constitutes a plant as such), installations with different lifetimes, and a heavy consumption of replacement parts.

And last but not least we must never forget all the other aspects of the competitive power of the newly produced units and conservation of resources, such as enhancement of the operating parameters and its effect of reducing specific consumption, wherein scientific research and technological engineering have an important part to play.

But the situation should not be interpreted as if introduction of the new only requires actions compatible with research and design work. Actually research begins in details at times, especially at the request of production and under the urgency of the haste demanded by it, and the design effort is expended on minor, disparate improvements without attacking far-reaching problems or measures are taken that have already been verified by experience. But however productive and stimulating the measures recommended by research and design may be, the indifference to the new that is often displayed in the production system may impair, waste or even annul the results. The specialists in the electric power plants must not only be more receptive to technical-scientific innovation but also participate effectively in planning, checking and applying the new measures.

Participation of production in processing research subjects is usually organized under various joint programs among units and departments coordinated with specific responsibilities. Nevertheless it may be said that the scheduled objectives and the results obtained have not always met the requirements, either in the quality of the proposed solutions or in observance of the deadlines. One explanation is that research often recommends solutions that are difficult to implement or unsuited to the productive units. A second explanation is that the enterprises are not always provided with the technical capacities to be able to accept the findings on the investigated subjects.

In order to determine the actual effectiveness of any research finding, consideration must be given to the economic effect from the standpoint of energy, greater productivity, the power input in its implementation, and its application and exploitation. It follows from the above that introduction of peak technologies in all units producing and consuming electric power is possible only by a well-coordinated and sustained effort on the part of all those involved in research and design and in production, beginning as soon as the research subject is taken up and ending with application and generalization of the new measures.

#### **Problem of Repairs**

It goes without saying that provision for the efficient operation of the power system by observance of the standards for inspections, maintenance and repairs and by prevention of breakdowns or accidents is essential to full exploitation of its technical-productive potential.

Whereas in general it is the quantity and quality of the elements of technical-scientific progress resulting from research and design work and incorporated in

the products that determine their performances and lifetimes, since they precede the equipment cycle, after that operation and, in a constantly growing proportion, maintenance and repair work, including modernization, are controlling factors.

Due to delay in repairs some generating sets broke down in 1961 and were out of operation for a long time. Analysis of the way the repair plans were fulfilled for the basic units for power production shows that 79 percent of the volume of planned repairs was performed in 1979 and about 57 percent in 1980. This had bad effects upon the whole economy. Moreover the durations of the sets' stoppages for repairs increased, and the standard durations of standing 'a' repairs were exceeded in the case of more than 50 basic power units. The situation improved in 1981, but the planned values were not reached.

It is obviously not enough to make the repairs. They must be of the best quality. But that would require greatly increased efforts to improve coordination and performance of repair operations and to secure the resources needed for centralized performance of certain categories of repairs. Therefore it is necessary to staff the respective units or sections with highly skilled personnel. I stress this point because in general it is found that the number of workers and specialists in the repairs field is decreasing, and in some cases the production units managements do not attach primary importance to their activity.

In another connection, the importance should be stressed of adequate and timely preparation of repairs so that in the case of planned stoppage of a generating set all material conditions, manpower and technical aid will be provided to perform the operations quickly and well. This requirement takes on a new qualitative content in view of the high technical level and great complexity of the power installations with very high unit capacities, because in most cases such an operation cannot be prepared in the plan year and steps must be taken far in advance.

The Burgoperaviti Machine Building Enterprise under the Ministry of Electric Power is a representative capacity in this field. It was specially founded in 1952 to produce spare parts and make highly technical or specialized repairs. Faced with the variety of problems in maintenance of the various generating sets in the system, the enterprise has tried to meet the requirements not only by accomplishing the intended objectives but also by following a regular policy of modernizing and improving the units, assemblies, subassemblies and elements in the process of construction or repair.

In Russia the time standards for repairing a unit as well as the personnel standards have been brought up to a level comparable to that in countries with power traditions, but the same cannot be said for the resources needed to meet these standards. We must bear in mind the difficult problems presented by modernization of power repairs and the special requirements for productivity, maintainability, adaptability and precision that must be met, especially since the complexity of the basic units and auxiliary installations as well as the operational importance of some auxiliary installations (pumps, turbopumps and equipment in the fuel control) increase with capacities of the generating sets, and they all require repairs of high quality.

Examination of the way repair work is done in a number of electric power plants reveals the paucity of ordinary mechanization means in addition to the shortage of highly skilled personnel. They are inadequately equipped with devices in

general use or with a wide range of applications, which devices are produced in Romania currently or are available upon request from the units of the Ministry of the Machine Building Industry and of other ministries as well. Therefore an organized priority effort is required to equip the power plants, especially those operating on coal, with complete sets of mechanization devices, lifting and transport means, installations for special processing, various portable machines etc.

On the other hand not such argument is necessary to point out the importance of providing the spare parts to make repairs properly, since experience tells us that nonfulfillment of the repair programs has often been caused by lack of spare parts and subassemblies.

Since many of the units in operation are imported, assimilation of the spare parts requires preparation of the right documentation, integration of special materials in manufacture, and procurement of the SDV's /Tools, Devices and Controls/ and working technologies, which operations usually take a rather long time. In the course of assimilating the spare parts, in addition to greater promptness we must always consider improvement of their quality by modernizations and by adopting new measures as compared with the license, in order not only to maintain performances but also to improve the quality of the machine as a whole.

Along with placing a growing number of domestically produced high-capacity machines in operation, conditions have been created for standardizing and unifying the various elements within some families of modules. Design and manufacture of such modules permits simplification of repairs and reduction of their duration, including industrialization of such operations as the methods of repair by replacement of component subassemblies and units are expanded on an increasingly wide scale.

The directive-program for research and development in the energy field for the 1981-1990 period sets fundamental tasks for conservation of energy by application of measures to further reduce specific consumption in all fields and sectors of activity, by rational management of fuels and energy, and by exploitation of new energy sources. Conservation of energy is considered the most important energy source we now have and consequently as the first course of action in the years to come.

In the case of electric power plants we must remember that they are not only power suppliers but also important consumers for their own technological needs and so-called "internal services." Consequently there is ample room for reduced power consumption even within the electric power plants. This can be done by eliminating escapes of water or steam, preventing heat losses or minimizing technological losses due to drainage, scavenging and exhausts. For the same reason it would be advisable to evaluate and analyze the power consumption of the various installations, equipment or machines used in the power plant in order to replace the ones with low power efficiency. In general the efforts to design, manufacture and implement a new generation of equipment primarily intended to conserve power should be increased and encouraged.

Since electric power production will be based predominantly on solid fuels, measures must be found that will considerably reduce the consumption of

metal used per ton of ground fuel (protection of abraded surfaces, refuction of the quantity of incompletely used metal, reappraisal of the operational factors causing premature wear and tear). For this purpose the research efforts and acquired experience must be concentrated upon lengthening the time of service of all parts subject to wear and tear.

To form and generalize a new conception of energy conservation and to establish a uniform technical language among specialists in various production sectors and those in research or design, some indices of energy consumption per product must be devised. The need is increasingly felt of a simple methodology as universally valid as possible to determine uniformly the economic effect, in power units, of the various directly or indirectly productive activities in any field. Under the present circumstances we must learn to think in terms of energy.

#### Maintenance Measures

Bucharest SCINTEIA in Romanian 6 Jul 82 pp 1, 3

[Interview with Alexandru Dobrisan, deputy minister of electric power, by Ion Teodor]

[Text] Efficient operation of the power installations by means of skilled servicing and maintenance and more prompt measures to remedy defects in order to make more intensive use of the installed capacity are major requirements in the Decision of the Plenum of the RCP Central Committee on Implementation of the Power Production Program in the 1981-1985 Period and Development of the National Power Base up to 1990. In this connection maintenance, repair and modernization of the installations producing heat and electric power are essential both for providing the power needed by the national economy and for producing it more efficiently. In other words, in the spirit and letter of the recent Decree of the State Council on Establishing Measures for Proper Management and Further Reduction of Consumption of Electric Power, Thermal Energy, Natural Gases and Other Fuels, strict conservation of energy must begin even with the producer. To learn what is being done for this purpose, we held a conversation with Alexandru Dobrisan, deputy minister of electric power.

[Question] To begin with please tell us, Comrade Deputy Minister, about the relationship between good maintenance and operation of the installations and the productivity of the generating sets.

[Answer] The workers in the power producing sector received the recent decree of the State Council with interest and a full sense of responsibility. There are a number of units producing heat and electric power with low inputs thanks to normal operation of the installations and application of strict measures to conserve the fuels. But some units are exceeding the specific inputs of fuels, and it is well known that the power producing units are also major consumers of energy. Directly or indirectly every provision of the decree also concerns us, the power producers, and reduction of power losses and operation of the installations more productively depends upon how they are maintained and operated. Accidental stoppage of a 330 megawatt generating set, for example, undoubtedly causes difficulties in the electric power supply and also involves extra power inputs in order to repair and restart it.

Question What steps have been taken this year to repair the generating sets promptly and properly to avoid the situations that made themselves felt last year? We know that an extensive program to repair the installations in electric power plants has been drafted to prepare the national power system for the next cold season. Of what does this program consist and how will it be conducted?

Answer The repairs program for 1982 specifies repair of sets totaling an average annual capacity of 2,181 megawatts. The program was drafted with allowance for making up the power quota and the modernizations that will be made in the 330 megawatt assemblies, which modernizations are intended to enhance the installations' operating safety and to reduce the fuel losses and the consumption of fuel oil necessary to make the combustion mixtures. The situations that made themselves felt in past years convinced us that any postponement or delay of repairs leads to starting the winter period, which means increased energy consumption, with unprepared power units. To forestall such situations this year we drafted efficient repair schedules and prepared the necessary resources and labor force in advance. Actually the repairs program is drafted in such a way that the planned capital repairs and current inspections will be made in all the installations before the winter period. Accordingly all the electric power plants will be able to operate to maximum capacity in the winter period. The action to procure the resources and especially the spare parts actually began last year. As contrasted with the situations in past years, the resources are now procured in almost all the electric power power plants, so that the repair operations can begin on schedule. We are specially emphasizing shortening the duration of the capital repairs, especially on the high-capacity assemblies, where modernizations will also be made to attain the operating parameters specified in the design. For example, in 1981 repair and modernization of assembly No 6 of 330 megawatts at Rovinari took about 6 months, but this year it is planned and the necessary conditions have been created so that the respective operations on assembly No 3 at Rovinari and Nos 2 and 3 at Turcent will take 4 months at most. In order to expedite the repairs and keep them within the planned periods of time, the repair and modernization of the high-capacity sets will be aided by specialists from the ministry, the Industrial Central for Production of Heat and Electric Power and other electric power plants, who will be jointly responsible with the enterprise managements for observance of the drafted schedules of operations.

In pursuance of the assignment to reduce imports, steps have been taken to recondition and assimilate some parts and subassemblies that were previously imported. This year the value of the reconditioned parts is planned to reach at least 260 million lei (a figure that is certain to be exceeded) compared with the 200 million lei that was reached last year.

Question You mentioned modernizing the 330 megawatt sets. We know the modernizations made on set No 6 at Rovinari considerably improved its reliability and operating parameters. Essentially, what are the modernizations that have been made and what is planned for their application to the other 330 megawatt sets?

Answer The improvements determined and applied jointly by specialists from the Ministry of Electric Power, the Ministry of the Machine Building Industry and the Ministry of the Machine Tool, Electrotechnical and Electronics Industry, as specified in the Decision of the Plenum of the RCP Central Committee of 31

March, are intended to lengthen the service lifetimes of the respective sets and to increase their realized capacities, and also to reduce their consumption of additive hydrocarbons. Among the chief improvements made in assembly No 6 at Rovinari I mention the increased diameter of the rotor mills and elimination of the separator in order to increase the grinding discharge, installation of the postcombustion grate in the cold funnel of the furnace to reduce losses of unburned particles of coal and to improve the stability of combustion, installation of a refractory belt in the area of the coal dust burners to increase the stability of the flame in the furnace, and installation of an improved slag conveyor belt in the cold funnel of the boiler. These measures increased the charge of the assembly from 160-180 megawatts to 250-260 megawatts and reduced the consumption of fuel oil from 25 percent to about 5 percent. Moreover a program was drafted to enhance the reliability of the auxiliary units, the feed pumps, gas and air fans, mills etc. This year three sets of 330 megawatts each will be modernized at Turcenti and Rovinari. The latest analyses indicate the possibility of modernizing a fourth set, and the entire operation is to be finished in 1983.

[Question] All the measures you have mentioned will have the expected effects only if the operating and maintenance personnel for the power equipment will be up to the level required by the equipment in the inventory, both numerically and from the standpoint of professional training. What action is being taken to supplement the working personnel in the electric power plants, to improve their professional training, and to strengthen order and discipline?

[Answer] According to the state plan our ministry is to hire 6,500 skilled workers in 1982, primarily for the new units and the Rovinari and Turcenti thermoelectric power plants, where the working personnel are still very unstable. The ministry's schooling system includes over 7,000 pupils, 2,600 of them in trade schools and over 3,800 in high schools, and 630 workers are taking qualification courses, so that the organized forms of training are meeting the requirement for qualified personnel. And in the light of the Decision of the Plenum of the RCP Central Committee in March on Development of the Power Sector, steps have been taken that will lead to stabilization of the personnel at the Rovinari, Turcenti and Anina thermoelectric power plants. Suitable housing accommodations will be provided, transportation of working personnel will be improved, and the workers' incentive will be enhanced by forms of remuneration better correlated with the results of work. Our analyses indicate that at present the workers' qualifications at some work places are below the high technical level of the installations. Therefore courses have been organized according to sections and shifts to improve the working personnel, in which they study the installations in the inventory down to the smallest details. Courses have been organized at the Rovinari and Turcenti thermoelectric power plants with the help of the workers training center under the ministry. An important forward step has also been taken to strengthen labor discipline. To this end, the provisions of the Decree of the State Council To Institute Rules for Operation and Maintenance of Installations, Equipment and Machines and To Strengthen Order and Discipline at Work in units with a continuous fire or which have installations that are very hazardous to operate are a real advantage in the activity of all workers in the power production sector, who are determined to spare no efforts to supply the electric power the national economy needs.

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CSO: 2700/337

## MACEDONIA PLANS LINK TO SOVIET GAS PIPELINE

Zagreb VJESNIK in Serbo-Croatian 24 Aug 82 p 4

[Excerpt] The energy crisis which has struck the entire country is most pronounced in Macedonia. This republic meets only 70 percent of its electric power needs, and only 40 percent of its needs from its own sources. As a result, industry now receives one-fifth less than it needs, and households have been restricted this much for a long time. But the Skopje Ironworks and "Jugohrom" enterprise in Tetovo are the most threatened; they are working at only 50 percent of capacity. The crisis is not expected to be surmounted by the end of the year, because the hydrological situation continues to be very difficult. Conditions will improve somewhat when the "Bitola 1" thermal electric plant goes into operation at the end of this month, but this is not a long-term solution. Intensive consideration has begun on using imported gas (from the USSR, Algeria, Iraq, Iran). Now discussions are underway on the possibility of tying into the gas pipeline for the East European countries. Ljubomir Korunovski, president of the Committee for Energy, Industry, and Construction of Macedonia, said, "We have been trying to solve the energy crisis by getting gas from Bulgaria. An agreement in principle has been reached with the Soviets, Bulgarians, and Romanians on linking up to the line that runs through Romania to Bulgaria. This would mean that we could tie onto the gas line in Bulgaria, about 30-40 kilometers from the border at Pernik or Ihtiman."

Initial estimates of Macedonia's annual gas needs from 1985 to 1990 are 600 million cubic meters, from 1990 to 1995 850 million cubic meters, and from 1995 to 2000, 1500 million cubic meters. A 250-kilometer gas line would be built to supply Macedonian consumers, namely from the eastern part of the republic to Skopje. Thus, two-thirds of the Skopje Ironworks capacity would be fueled by gas. The gas line would be completed fast--in 2 to 3 years--it is estimated, along with much lower investments than are needed to build thermal- or hydroelectric plants. For instance, the gas line would be 50 percent cheaper to build than a thermal-electric power station providing the same amount of power. Korunovski said that the exact estimate of investment funds needed will be given after the joint technical-economic plan has been worked out which is the next stage in negotiations. All of this is expected to be done in the shortest possible time so Macedonian industry can count on Soviet gas from Bulgaria as soon as 1985.

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Sept. 22, 1982